The Veterinary Record.

(Founded by William Hunting, F.R.C.V.S., 1888.)

No. 52. DECEMBER 29, 1928. Vol. 8.

A Brief History of Veterinary Science, with Extracts from "The First Booke of Cattell."*

By C. Masson, M.R.C.V.S., Torquay.

In complying with the request of our popular honorary secretary to give you something for this meeting, I did not quite realise what I was undertaking, but felt it was my duty to take my turn with the rest.

Being only a general practitioner I felt that I could not attempt anything out of the ordinary, and, as most of the more or less popular subjects have been given at one or other of the meetings in recent years, I thought a diversion from the usual beaten track might be attempted.

I therefore propose on this occasion to give you a very brief history of the dawn of veterinary science up to the 17th century and to amplify my paper with some extracts from "The First Booke of Cattell"—"gathered and set forth by Leonard Mascall, 1600 A.D."

My time has been very limited and I very much fear the paper will prove a failure, but I trust my colleagues present will help to make the afternoon interesting by mentioning old-fashioned treatments of which they are aware.

A Brief History of Veterinary Science.

Veterinary science is a very old art and was practised prior to the year 2200 B.C.

In the Code of Hammurabi—Genesis xii—it is stated :—

"If a veterinary surgeon treats an ass or ox for a serious wound and saves its life, the owner of the ox or ass shall give to him a fee of one shekel" (present value about fivepence).

"If, during treatment, he inflicts a serious wound on the animal he must pay to the owner a sixth of a shekel, and, if the animal should die as a result, he must pay the owner one quarter of the animal's value."

Little is on record about veterinary treatment in these early Egyptian days, which is surprising, when one remembers that the Egyptians were great animal owners and agriculturalists, and that many of their animals were sacred and preserved at great cost, the horses of the kings often being killed, embalmed, and buried in the same tomb as their Royal owners. It is known, however, that the fees received then were small.

The veterinary art was carried on chiefly by the shepherds, who were apart from the peasantry, and were held in low repute.

A papyrus on veterinary treatment was discovered in 1889 by Professor Flinders Petrie, but it is so badly damaged that little sense can be made of it. The Egyptians put nearly everything of importance into writing, but these writings have been lost to us.

Little is known about the work of the Greeks, but Democrates—B.C. 470—was one of the first writers on the veterinary art in that country, and it is said he was one of the first to write on the subject of anatomy.

Simon of Athens (another Greek)—B.C. 430—like many of the other early writers, wrote on the management of horses.

Mago (a Carthaginian)—200 B.C.—wrote extensively; no fewer than twenty-eight books are known to have been written by him on agricultural subjects.

The Romans, like the Egyptians, were chiefly agriculturalists, so it is not surprising to find many Roman veterinary surgeons and writers, and of these, Hippocrates—B.C. 460—wrote, amongst other things, on pathology, and mentions hydatid cysts; and Aristotle—B.C. 333—wrote extensively both on the management of animals and also on treatment. He mentioned, among other things, that the horse had no gall bladder, and also the operation of ovariotomy in the sow. Cato—B.C. 233—one of the first Romans to put his knowledge to writing, mentions sheep scab and ticks. His works have been translated into English.

Virgil—B.C. 70—wrote the four books of Georgics—meaning agriculture. All his works are in verse, and several of his poems are quoted in "The First Booke of Cattell"—some of which I will read to you later on.

Celsus—B.C. 40—also wrote, but his works have been lost, though they are repeatedly quoted by later writers, including Mascall; and Varro—B.C. 36—wrote on animal diseases, but his works are not original, being compilations from others.

Pliny—50 A.D.—one of the first writers of the present era, was chiefly a compilator, like Varro.

The works of Columella—55 A.D.—mark the first steps taken to prevent the spread of contagious disease. They are the first authentic books on veterinary science—the chief one is called "De Re Rustica," and Mascall frequently quotes this author.

Galen—131 A.D.—a doctor, was one of the first to advise comparative medicine. He prescribed ass's milk to a patient and considered that the animal should be inspected first before the milk was used.

Gargilius—220 A.D.—wrote on cures for animals, but his cures were all of the superstitious nature.

Vegetius lived between 450 and 500 A.D. His book was the first one written in the Christian era to deal entirely with veterinary medicine.

All through the world's early history the treatment of animals was always regarded as a contemptible profession and beneath the dignity of the educated mind, but Vegetius pointed out that knowledge can never be mean nor contemptible and that there can be no shame in practising a profession which can save the State from loss.

Treatments about this time were made up of dung, urine, and animal extracts, and an example of such is the treatment for malleus, which was as follows: "Bake a live stork to powder and make a spirituous decoction of

* Paper presented to the Western Counties Division N.V.M.A., at Taunton, on 15th November, 1928.

the remains "—a spoonful of which was given daily till the animal recovered, or died.

Hierocles, who lived at the end of the fourth century, was a lawyer, but preferred veterinary work, which he took up as a hobby. His writings are contained in a book called "The Hippiatrica."

In the tenth century Constantine the Seventh—the Latin Roman Emperor of the Bizantine period—realised how literature and culture were degenerating and endeavoured to revive them. He founded a learned circle for the writing of history, and, through him, the works of the old Bizantine authors on veterinary art were collected and handed down, and put to pen in the "Hippiatrica." The actual compiler of the "Hippiatrica" is unknown. The book is an accurate reflection of the Greek knowledge of veterinary science at that period, and reproduced the views of the experts, several authors being included in its pages.

From the seventh up to the twelfth century the Arabs were the principal men to further veterinary science; the chief of whom was one called Abul Bekr, veterinary surgeon to the court of the Sultan.

One of the first Saxon books to be written was "The Leech Book." It was written in the early part of the 10th century, during the life of King Alfred, or shortly after. Though chiefly on human medicine, it contains reference to three veterinary diseases. "Elf-shot," one of the diseases which signified acute tympanites, was attributed to a mischievous elf or demon. The treatment was: "Take sorrel seed and Scottish wax, let a man say twelve masses over it, and put holy water on the horse or bullock"—or, "take an eye of a broken needle, give the horse a prick with it, behind, in the barrel, and no harm shall result." I think the translation here is in error. It probably means a needle with a broken eye.

"The Herbarium," another book of the Saxon period, was copied from the Latin text. It was written in the early part of the eleventh century and contains a manuscript entitled "The Medicine of Quadrupeds." It is described in the text as "The leechcraft of wild deer or wild beasts."

The medicinal substances used were obtained from animals, such as the deer, fox, hare, goat, ram, boar, wolf, dog, lion and bull. All parts of the animal body were used, including the secretions and excretions, either in the crude form, or as extracts, or after burning.

A deer having been captured, its teeth were drawn while it was still alive, and were used as amulets by men, to ward off storm, evil men, or pestilence; and nothing would touch the one who wore it. Then the deer was killed, and the blood, mixed with salt, was given to animals suffering from pestilence or any other "evil." The hide was used as a preservative to hounds and other animals against pestilence. The antlers were used, in the form of hartshorn, against snake bite, sore head, loose teeth, worms, and to drive away snakes.

Rabies was treated by giving the head and liver of the rabid dog to the bitten animal, somewhat in the same way as pulped spleen is used to inoculate bullocks against rinderpest at the present time.

Evil spirits were said to be the cause of convulsions and fits, and these conditions were cured by giving the patient the ashes of a white hound baked with meal.

Ox bile was given for bad eyesight, fox loin fat for sore ears, ram's lung for ulcers on the face, and extract of brain for headache. What is the specific in goose lard used to-day for mastitis?

During the tenth and eleventh centuries the knowledge of the Bizantine writers began to reach England, but the Church regulated and withheld the knowledge. This was the period of superstition and the use of charms and amulets.

Three days in the year were dangerous for blood letting: the first Monday in January, the last Monday in April, and the first Monday in August. Furthermore, there were two days in each month dangerous for bleeding, and one hour in each of these days, and, if bleeding was performed at that time, death would result, or a long illness follow. These superstitions exist to the present day in many places.

There were two patron saints: one, St. Eloi, the patron saint of horses, and the other, St. Herbot, the patron saint of cattle; and both were said to perform marvellous cures, such as shoeing vicious horses by taking off the leg, fitting the shoe, and then putting the leg on again; even restoring life was not beyond them.

The Church seems to have held a grip on the masses, and most illnesses and treatments were supposed to be due to elfs and evil spirits. The works of Vegetius and others were probably censored by the Church, so that it would not lose its hold on the people. It taught the people that diseases were due to evil spirits, and could only be cured by prayers and incantations.

One treatment for curing cattle at this period was: "Begin with a Psalm, then take two four-edged sticks, and write on either stick, on each side, the Paternoster to the end. Let the inscribed stick fall on the ground." This would probably cure the animal.

Another: If an animal swallowed an insect, if it was a male animal, a lay was sung in the right ear, but, if a female animal, it was sung in the left ear.

Even to this day many of these old Biblical cures are carried on. I remember hearing of a case in the Highlands of Scotland where a crofter's wife was gored by a cow. Her husband looked up the prayer book to find a suitable prayer for the occasion, but was unsuccessful, and the poor woman died.

Early veterinary books are characterised by indefinite and vague symptoms, and it is often very difficult to know which disease is meant; for example, in reading the chapter "Against the lungs of cattell infected," it is difficult to know whether tuberculosis or contagious pleuro-pneumonia is meant. Again, murrain (or murren as it is spoken of to-day), which, when translated, means "an infectious and fatal disease of cattle" or a carcase, is spoken of as "the murrains," and seems to include all infectious diseases, and the "cure" seems to have been the same for the lot. Similarly, malleus—from the Greek *malis*, meaning a distemper in horses and asses—is used to cover all infectious diseases of horses, though undoubtedly it was glanders which was meant. Garget, also, covers many different ailments.

It is interesting to note that, even in these early days, though they attributed the diseases to chills, bad pastures, etc., they isolated and separated the sick from the healthy cattle.

The treatments adopted then were often ludicrous, such as cutting off the left leg of a frog and then pushing it down the animal's throat to cure hæmoglobinuria; or giving a bullock with redwater a red herring—apparently they had red herrings in these days. This latter treatment, though purely empirical, was apparently on the right lines, as, for example, our present day treatment for bovine piroplasmosis by giving common salt or brine; the salt in the red herring apparently doing the trick.

Again, human urine for bathing sore shoulders is not far wrong, if somewhat disgusting, the ammonia being of some use, and I know horsemen at the present time who still employ this treatment and swear by it. Spider's web for hæmorrhage is good, and I know of a case where it stopped the blood when everything I had tried had failed.

Hog's dung, as a medicine, is still used in the North of England and in Scotland for curing diseases of sheep.

The belief in the fact of a horse standing for a long time—a month or more—in front of a lavatory making him go blind, may not be so far-fetched as one may at first surmise, as the ammonia fumes might cause it. Urine apparently has a very irritating and corrosive effect. I was talking to a sanitary inspector and a surveyor of a South Devon town recently and they informed me that one could quite easily kick one's toe through the foot of many of the lamp-posts in the town, as they were all corroded away by dogs micturating against them.

The old-fashioned method of putting red-hot baked clay against the bullock's jaw, for actinomycosis of the jaw, is still carried out in some parts of England to this day—only a red-hot brick is used in place of the clay.

Some methods of treatment are quite sound, such as in "tailing" sheep; they recommend applying dry loam on the parts afterwards, in much the same way as a nurse would use dusting powder on a baby, but, if the sheep is raw behind, they recommend the application of tar. They lay down as good advice to the shepherd that he should not go out without his dog, his crook, or his bottle of tar.

The sheep were held in high esteem, and even had poetry written about them, as, for example:—

A Praise of Sheepe.

These cattell (sheepe), among the rest,
Is counted for man, one of the best.
Nor harmful beast, nor hurt at all,
His fleece of wooll doth clothe us all;
Which keeps us from the extreame colde;
His flesh doth feede both young and olde.
His tallow makes the candles white,
To burn and serve us day and night.
His skin doth pleasure diverse wayes,
To write, to wear at all affrayes.
His guts thereof we make wheele strings,
They use his bones to other things.
His hornes some shepheards will not loose,
Because, therewith, they patch their shooes.
His dung is chiefe, I understand,
To helpe and dung the plowman's land.
Therefore the sheepe among the rest,
He is, for man, a worthy beast.

Even Devonshire is mentioned in "The First Booke of Cattell." In writing of dipping and washing sheep it says: "In Devonshire they never wash their sheepe when they clip, but after; wash the wool, before they spin it, in warm lee (which is ashes and water) and drieth it on hurdles."

In these days sheep were kept in houses or stables, and the shepherd is warned about looking out for beasts and worms—presumably sheep scab and maggots. They dipped their sheep in boiled rain water and salt, and, if near the sea, they bathed them in it.

They knew all about sheep scab, and used sulphur and oil and tar. Virgil is quoted in this respect, as follows:—

When sheepe are greatly beaten with raine,
Then frost and colde increaseth their paine,
Whereby the scab will then increase,
Which ye may kill with tarre and grease.

This reminds us somewhat of our Materia Medica mnemonics.

(Curiously enough, I was talking to a farmer only last Sunday on the foot-and-mouth disease outbreak, and he was of the opinion that foot-and-mouth disease and other diseases, especially sheep scab, were brought about by wet weather.)

The old treatment for ringbone was barbaric. They first of all scarified the horse's coronet down to the bone. Then they applied dry quicklime, taking care not to let it get near the coronary band; they then applied a bandage, and rode the horse into the water, and kept it there for a considerable time. One can imagine the result, for they add that the resulting sore must be healed with salves.

Another odd treatment for "loss of the quid or cud" was to give the affected animal some cuds from another animal—this is somewhat like our present day treatment with biological products, such as the use of pepsin and rennin.

During the twelfth century, Roger the Second, King of Sicily, issued a decree prohibiting practice by unqualified men.

In the thirteenth century, one Jordanus Ruffus, chief veterinarian to the court of Frederick the Second, brought out his work on Equine Medicine, and his book marks the starting point of the regeneration of the veterinary art in Europe. He was an expert on shoeing and diseases of the foot and we could teach him little at the present time.

In the fourteenth century, Laurence Rusius, an Italian, was the chief veterinary surgeon to further the good work started by Ruffus.

During the fifteenth century very little further progress was made—chiefly due to the civil wars, and most men were content to follow the teachings of Ruffus and Rusius.

In the sixteenth century the medical profession and others, seeing the plight of the veterinary art, tried to pull things together, and the man whose name deserves most mention was one Carlo Ruini, an Italian, who brought out a book entitled "The Anatomy of the Horse, Diseases and Treatment."

Nothing very new seems to have taken place at this time, either in general knowledge or treatment, and it was not till the following century—which is beyond the scope of my paper—that actual progress in the science occurred.

It was during this century that Leonard Mascall, the author of "The First Booke of Cattell," lived.

The first edition of this book appeared in 1587. It was reprinted in 1591, 1596, and again in 1600, and it is this last edition which I possess.

After the sixteenth century veterinary science began to assume something of a scientific form—from the barbarous and empirical treatments previously employed. This was greatly due to the interest taken in it by, among others, the medical profession, and many writers began to publish works. My paper is not intended to reach this period, but I thought a few brief remarks about this period might be interesting.

In England, about this time, the Duke of Newcastle did a lot to encourage the art, and I think it would have been a gracious compliment to the present duke if the fact had been mentioned at the annual congress at Newcastle this year.

The first important step to promote veterinary teaching occurred at the instance of the Ocden Agricultural Society, in Hampshire, which, at the instigation of a Frenchman, Monsieur St. Bel, opened a school in London, to which they gave the name of "The Veterinary College of London." This was in the year 1790, and he was appointed the first principal.

On his death, Mr. Coleman was appointed, when several new regulations were adopted, including the appointment of examiners to examine the students for their diplomas.

Four general examinations were held during the year, but the period required for a student to qualify depended entirely upon the talents and industry of the student.

. . . . . .

I now propose to quote some extracts from "The First Booke of Cattell."

The "Booke" starts with a poetic foreword, as follows :—

Thou herdsman, keeper of thy beastes,
When any beast is sickly,
Search herein and thou shalt finde,
Of proov-ed remedies quickly.

I may say here that the spelling and grammar are peculiar and can only be really appreciated by reading the text oneself. There are practically no full stops and sentences run on one into another.

The "Booke" is dedicated thus :—

"To The Right Worshipful, Sir Edward Montegue, knight, Leonard Mascall wisheth increase of worship, to the honour of God and the benefite of the commonwealth."

You will see that the "Booke" is written with all sincerity.

The Book continues with a foreword "To the Reader," as follows :—

"When I had gathered and collected (gentle reader) certaine medicines how for to helpe cattell and to cure them, I considered what benefit and profite it might be to my countrie and commonwealth, specially unto the husbandmen, and such as have the curing of Oxen, Horses, Sheepe and such other Cattell.

"For, oft times, for want of knowledge, many cattell, being sicke, doe perish and die, whereas, sickness and hurtes are accidental unto men in diverse ways, evenso, it chaunceth unto cattell, whereupon I thought it good to take this occasion for the love of my countrie and commonwealth to write somewhat—partly of the curing for our most used cattell, as Oxen, Kine, Calves, Sheepes, Hogges, and such; with diverse approved remedies for them. Plainely and perfectly set forth, as well to be understood of the learned husbandman as of the learned Gentlemen; shewing somewhat, moreover, for the bones setting in a beaste. Declaring likewise the order and nature of hogs, with the use of dogs and the cause of their madness, with certain helpes against the bitten cattell; and also to helpe mangie dogs; with diverse approved wayes to catch moales in any kind of grounde.

"Which thing ye shall finde out in the tables of the same, by alphabet, and number, devided into three bookes.

"Trusting (gentle reader) thou wilt take all in good parte as is meant of the author hereof."

L. M.

The first disease is "AGAINST THE MURRIN OR PLAGUE AMONG CATTELL."

As I said before, apparently all infectious diseases of cattle were called "murrins," but I think you will agree that this murrin was probably anthrax. It says :—

"As for the Murrin or plague among cattell, there bee meanes enough that can helpe the same being taken betimes. Which disease cometh of an infection of the bloode, and it appeareth commonly first in the head—(probably brain symptoms are meant)—And when he doeth once froth at the mouth, he is then past remedie, and shortely after he will die, and yet, when they are thus sicke they will eate.

"The remedies are; ye shall flea, *i.e.*, skin, the beast that is so dead and burie him in a deep pit, and cover him well with earth, that no dogs can come to the carion. For, so many beastes that do smell thereof are like to be infected with the same disease; and forthwith ye shall have the skin straight to the tanner, carie it not home, for fear of more peril may fall thereof. There is a common use, and done of a great charitye, which is, they will put the beastes skinne on a pole, and then set it in a hedge, fast bound to a stake, by the highway side, that everyman riding by, may perceive thereby where the sickness of cattell is, and also in what township; and they hold an opinion it will thereby cease the rather, which I doe scarcely believe. But a beast having the Murrin, being flayed, it will appear between the flesh and the skin, for it will be as though it were full of froth bubbles like blisters, some blackish, some blewe, and some yellow, which will commonly be in a fat beast, an inch thick and moore deep in the flesh.

"There have been some beasts that have died of the murrin (as I have been credibly told) he that flayeth him died soon after, and he that went with him to the tanner, and the horse that carried it, and the Tanner that tanned it, all these died soon thereupon, which was thought it was by the infection of the stinking skinne, but being true, it was a marvellous infection. Therefore it is thought good of some to burie them whole for fear of a further inconvenience. This cure is thought good of some—to take a small cord and bind it hard about his necke; then on the further side ye shall feel a greate veyne, and with a lancet yee shall strike thereon and let him bloude a pint or more, and so likewise on the other side of his necke. Then take away the cord and it will suddenly stanch, but, if the signe be there he is in more danger of bleeding still.

If he so doe, ye shall clappe to bruised nettles and salt or wild tansy bruised and layd on; and some therefore do give them drinkes. Thus must you serve all your cattell that are infected, or being together in one pasture—so doing, ye shall avoid the greater danger in this disease. For the murren it is taken by venomed grasse, by companie, and poysoned water, and by hunger."

"To Breede Calves and to Gelde Them."

"If ye will breede calves to make young bulles, take no calf that is calved within the prime (apparently springing of the udder is meant), which is counted the five dayes after the change, for those will not prove well, as some husbands say. Nor likewise also any calfe (or other) then calved, is not good for to keepe, but to eate or to sel; and, among a hundred calves two shall be sufficient for to make buls, as for all the rest, it shall be best for to geld them soone after they are calved, or at two yeares of age, and then to lay upon the sores the Ashes of Vine twigs burnt and mixt with litharge.

"And on the third day after, ye may melt of tarre and mingle of the said ashes therewith, and anoint therewith for fear of swelling.

"Also the manner of gelding of calves, Mago doth counsell and say, that calves would be gelded when they are young and tender, not with any iron, but with a cloven hazel stick, and so pressed together, and then race the cod, by little and little, till it be consumed.

"This he taketh to be the best way of gelding, when they are yong and tender, for this kind of way is done without wound.

"For, when a calf is somewhat big, he would better tarry unto two years than to geld him at one year, which to geld then is best in Autumne, when the Moone is in decreasing, and the signe from that place, ye shall then cast him and travesse his feete together, and before ye touch him with iron, ye must take up his stones, then take two straight lathes like rulers of woode made like a pair of barnacles or tongs. Then take up the stones with the nerves and stringes that the stones doe hange by, then close your tongs under betwixt his body and his stones, close them hard together (leaving the stones on the outside thereof) some gelders make them of iron for the more strength.

"Then slit the purse first of one codde, and put forth the stone thereat, and cut him off within, hard by the said tonges, and close by the nerves; and so likewise take forth the other stone, and then some do seare it for bleeding too much, and anoint it with fresh grease, and let him goe, but, see to cut them in such sorte that ye leave the ends of the strings joining to the said nerves for thereby he shall not loose much of his bloud, and shall not be all feminate, nor yet very stout of his members in leaving still the forme of the male, although the force of ingending be taken away, the which he will not suddenly loose, but by and by after he is gelded, for when a horse or bull is gelded, they will (if ye will suffer them) cover incontinent, and certainely engender, but ye shall not suffer any so for to doe for feare least they die of the bloudy fluxe, but, after yee have so dressed him, ye shall so annoynt him with fresh grease.

"Some doe annoint after he is cut with the ashes of the tender Vine branches mixed with the skumme of silver, then ye shall give them no drinke for the space of three or foure dayes, but to eate of greene hearbes, and give him but little thereof, for ye shall nourish him as though he were sicke, in giving him the croppes of trees and greene hearbes.

"The least danger in gelding an olde beast is a boare, all other beasts are more dangeorus, being gelded when they are olde.

"Some doe use a kinde of gelding for yong calves or foales under nine days; or as soone as the stones descended downe into the codde, they will by and by take him,and knit softly the purse of the codde betwixt the stones and his body with a shoemaker's threede, and, as the foale doth growe and increase, the stones will consume and weare away, which kind of gelding (as I have learned) they doe use in the North partes.

"Aristotle saith, it is jeopardie in gelding all kinde of cattel being olde, except swine; and likewise it is best gelding in the increase of the Moone, for it will make them growe faire, large, and bigger then those which are gelded in the waine of the Moone, so that ye geld or splay in a good signe.

"Also in cutting or letting bloud, these signes are counted most dangerous, if the Moone have power over them—as Taurus, Leo, Gemini, Virgo, and the latter part of Libra and Scorpio, and also the two signes governed under Saturne, as Capricorne and Aquarius. The rest are all good, as Aries, Cancer, Sagittarius, and Pisces, so that the Moone be not in them.

"Also ye shall note, that if the signe be coming within a daye of the cut place, it shall not then be so good to cut without a more danger, as when the signe is once past the place.

"For a greene wound being newly cut, the Signe coming nigh unto it will cause it to bleede afresh, being but a little moved, or else to growe and breede to some imposthumation of bloud or other humours (abscess) which hathe beene often seene among cattell, whereby they have dyed thereof, but to geld your calves when they are but yong is counted best—as when they are of sixe or eight weeks old, for else (as some husbands say) they will not commonly prove so faire nor so good to weane.

"If any calfe doe swell after he is new gelded, some doe use to burn one of his stones to powder and so beat it small, and cast it thereon, and some doe mixe it with neates foote oyle, and so annoint the sore place therewith."

"To Help a Cow of the Whetherd." (Retained Placenta.)

"To helpe a cow that is whethered, that is, when she hath newly calved and hath not cast her cleaning, she ill die of it shortly after.

"To make her voyde and cast the same, ye shall take a good quantitie of the juice of mallowes, and mixe it with ale or wine and give it, which is goode to repulse the latter birth after the cow have calved, or a good handfull of peniriall and strain it with ale and so give it.

"Both these are goode against the said disease.

"If ye shall see knots in the mouth (presumably mouth of the vulva) then judge she hath not cleaned of her birth; then must ye take them from her, or she will die."

"To Helpe a Beast Prickt with a Thorne."

"Ye shall take a beetle fly, cald of some a thumbard which creepeth commonly on horse dung, or other dung, slit his belly but kill him not, and lay to the cut place, where the thorne went in.

"If anything will helpe this will doe it, but somewhat paineful awhile.

"Another, take the blacke snail that beareth no shell, bruse it and lay it on."

"Against Swelling of Cattell by Eating of Greene Corne."

"If your cattell do chaunce through negligent keepers to break into your corne and eat thereof when it is nigh ripe (as in time of harvest), of barlie, rie, or wheat, it will make them mightily to swell by lying and sprouting in their mawes, which thing will put them in danger of death, if they have not soone remedy.

"The helpe is: some doe use to drive them up and downe till they see them asswage thereof, and so they recover, and some do throw a new layd egge, shel and all, into the beast's mouth, and breakes it in the mouth, and makes him to swallow it with ale."

"To Helpe the Loue" (Panaritium).

"The loue is a disease which breedeth in the clawes of a beast, and comes (as some husbands say) by treading in the doung of Christned folkes, which burneth them betwixt their clawes, that it will make them to halt.

"To cure, ye shall take a roapes end, and rub and chafe him betwixt the clawes therewith, so that ye make it bleede.

"Then annoynt it with some tarre, and fresh grease, and it will heale soone agayne."

I employ this treatment, modified, at the present time.

"Against Pissing of Bloud or Bloudie Fluxe."

"Ye shall take a frog and cutt off his left leg and so put him alive into the beastes mouth, but then ye shall have ready a handful of salt mixed with a pint of goode stale wine, and, as soon as ye can afterwards, give the drench and make him to swallow it all down together. This remedy is considered very good and is much approved of."

I sometimes think there might be something in these weird treatments. I had a student at the Seale Hayne College suffering from tuberculosis. He was ordered to swallow five live snails a day by a French specialist and it made a new man of him.

"Impostumes in Beastes to Help." (Abscesses.)

"If any beaste be troubled with an impostume or such like sore, the best shall be to open the place with an iron, and, when it is cut, then shall ye crush forth all the ill humour and matter therein. Then stirre and wash it cleane with the warme urine of an oxe, so done, then use such things as doth cleane and heale."

"The Causes of Pestilence in Cattell."

"One thing is the chasing of cattell; wherefore ye must not chase your cattell much, specially in sommer, for that doth besides bring unto them the fluxe of the bellie, or else an ague.

"Also, ye shall neyther let hogges or hennes to enter into their stalles, for, their doung being mixt with your cattells meate, breede a pestilence at leangth and kill them.

"And specially the doung of hogges doth breed a murren among cattell (the sooner) in eating thereof, if remedie be not soone had, they will growe to a murren, and die thereof.

"The remedies are these, ye must by and by change their laier and devide them into many partes and farre off from thence.

"And also separate the hole from the sicke, for one beaste infected will poyson all the rest in short time.

"Now when ye have changed them into other partes, ye must put them where no other beastes doo feede with them, to the end they doe not infect others therein; and to overcome this pestilent evil, is to give them medicines."

"Against the Turning Disease in Cattle" (Sturdy).

"There is a certaine disease comes to some cattell, called of husbandmen the turning disease. Which disease, in eating their meat will cause them to turne about, also cattell which are troubled with this disease are alwayes in danger to fall into pits and ditches and such like.

"The cause is, there lies a bladder under the scul in the forehead of the beast, which is betwixt the braine and the braine pan, which bladder must be taken forth, or he will never amend, but instead he will die thereof.

"The remedy: ye must cast him and binde his four feet together, and then ye shall feele all over softly with your thumbe thrusting thereon, and, where ye find the softest place, a little there above ye shall cut the skinne overthwarte foure inches, and so likewise beneath the soft place.

"Then also in the middell ye shall cut the skinne downward betweene the two overthwart cuts, and flea those skinnes on both sides, then turne them up, and pinne them with pinnes; then take a sharpe knife and cut the brain panne there under two inches broad, and three inches long; but, beware your knife go no deeper then the thicknesse of the brain pan for piercing the braine, for if ye do so, the beast will die.

"Then ye shall take away that cut bone and ye shall see a bladder there under, two inches or more long, full of water, which bladder ye shall softly take cleane away, and see that ye hurte not his braine. So done, then ye shall lay downe again the cut skinne, as before, and sowe them fast together; then bind a linnen cloth three or foure folde, dipt in fresh grease and tarre and laide thereon, which will keepe it from winde and colde, for the space of ten or twelve dayes, which skinne will so growe againe, and he shall do well.

"And here upon I have seene many recover and doe well. But, for the more suretie, when a beast is troubled with this disease, being fatte, or having any reasonable flesh on him, is to kill him, and so there is but small losse.

"The like disease ye shall have in yong sheepe."

"Against the Lungs of Cattell Infected" (Tuberculosis or pleuro-pnemonia).

"If the lights or lungs of a beast be infected, which is a grievous disease. For thereby he will ware leane, and pine away, and at length he dries so in his body by a common cough, thereby, at the length it will kill him, if he have no remedie.

"The remedies are, ye shall pearce one of his ears withe a little bodkin, and being so pearst, ye shall put into the saide holes the burnt roote of some hazel tree. Then,

take a quantitie of the juice of leekes, with so much sallet oyle, and mixe it with a pint and a halfe of wine, and give it him fasting, use this nine mornings together, and he shall doe well.

" But ye shall understand, if the beast have continued long therewith, he will then stand much and eat but little, and therefore he will ware hollow and thinne of body, and sometimes he will cough twenty times in one houre.

" Then he is sore taken and faree gone therewith, and very few doe recover, if he be not looked unto.

" Therefore, the best way is, yee shall devide your cattell asunder, so many as he hath companied with, and then let them bloud a little as afore said."

" FOR THE GARGET UNDER THE EAR " (Actinomycosis of Jaw).

" The swelling or garget in a beast comes commonly with colde in winter, or by eating evill meate, which will breede a garget under their jawes or cheekes; the remedie, ye shall take blew, hard clay, and boyle so much as a bowle, in chamberlie till it be consumed and molten, then, all scalding hote, bathe the swolne place therewith, and alway stroke it downward; use this three or foure times a day till it swage, and this will helpe it.

" Or, take blew clay, with a pinte or more of milke, of barrow hog's grease, then boyle them together till all the clay be consumed, then, as hote as ye may, scalde the garget or sore therewith; use this twice or thrice and it will helpe."

. . . . . .

I could quote many more cattle diseases to you, but I think I will now give you some chapters from the " Second Booke"—" Treating of the Government of Horses with the Approved Remedies against most Diseases."

This " Booke " also starts with a poem, entitled "TO THE HORSEMASTER AND BREEDER OF COLTES."

1. Ride not thy horse too young I say,
   Nor labour him too sore;
   Where gristles are as yet but weake,
   Strive not with him therefore.
2. A young horse soone doth catch a crush,
   And wilfull oft they be;
   Whereby their sorrowes do increase,
   As daily ye may see.
3. Therefore to use and tame thy coltes,
   From yeare to yeare take paine,
   And when thou makest them ready sale,
   The more shall be thy gaine.
4. Thy horse once sicke, deferre no time,
   His griefe, for to appease;
   For soreness oft so dangerous is,
   Thou maist thy horse soone leese.
5. If thou dost marke of sorenesse most,
   Whereof they doe proceed,
   Thou shalt find out that most do come
   For lacke of taking heede.
6. Therefore, let this booke be thy glasse,
   Wherein thou maist have sight,
   How for to helpe and save thy horse,
   Wherein thou hast delight.
7. Here maist thou find, both learne and see,
   No kinde of helpes to want;
   Of secret knowledge in thy horse,
   Which skill hath been full scant.

Then follows " *A Proverbe,*" as follows:—

To trust all currant horse coursers,
I vise thee to beware;
For truth among the most of them
Is found to be full rare.

After a peculiar poem, a chapter on breeding colts, the last few sentences of which are as follows:—

" Without doubt it is most true that in some countries the mares be of so great heat, and desire so to be covered, that, although they have not the horse, nevertheless, in thinking and desiring so much the horse, they burne so within themselves, that in thinking thereof, they become with foale."

" Like as the birds of houses, at Cockes to laye egges, and hennes to lay egges without the Cocke."

The first disease I will quote is: " FARCIE OR FASHION."

" If your horse have a farcie or fashion, it is an ill disease to cure, but, if it be taken in time, it may be well cured.

" It will runne by veines through the body, and appear in many places of the bodie, like knottes or bunches as bigge as halfe a walnut shell, and, by following a veine, at length it will breake itselfe and runne filthy matter, and, as many horses as doe touch or gnaw of him within one month shall have the same disease, or, if he do bite any other he will infect him, and, if they be not soone helpen they will die thereof.

" If any horse have it, avoid him at the first if ye can, for endangering all the other.

" This sorenesse commonly commeth of a corrupt bloud and humour engendered in the body, and sometimes it comes of bruised bloud by some stroke, or, of some galling or byting with some other horse, or of tikes or hogge lice (as some do say).

" The cure—let him bloud on the veyne nigh to the sore. Then burn every bunch, in plucking them up with your hand to burne them the better, and leave none unburned.

" Then annoint them everie day with melted hogges grease till they fall away; then have ready a pottle of old stale, and boil it a little with some coperas and salt, and a handful of strong nettles, and, therewith, warme all the corrupt sores, then, fill each hole with the powder of slacked lyme; do thus once a day until the holes are closed up.

" If any do rankle more than others, fill those with verdigrease.

" Use this, and ye shall see experience."

" GLANDERS IN HORSES " (probably Strangles).

" The glanders is an ill disease, taken by a heate and a sodain colde, and appeareth at his nostrels, and to have kernels under his jowles, which will paine him for to eate, and at length will run at his nostrels.

" The remedy is—take hote horse dung and pisse, and clap it under to his jawes and so perhaps it may go away againe.

" If not, the remedie is, seeth a handful of pulled garlik in milke, and put a peece of butter thereto, and some ale, then, stirre all together, and give it him fasting, and ride him softly thereafter.

XUM

"THE MOURNING OF THE CHINE" (probably Glanders).

"The mourning of the chine is sorenesse doubtful to cure, and is taken of sore travell and then a sodaine cold; which disease is uncurable. For as a Frenchman saith:—

'To heale the mourning of the chine
Is hard to find any medicine.'

"It will appear at his nose like the Oake water, blacker, or, as it were, soot and water mixed together, more blacker than the glannders."

"BROKEN WIND."

"A broken-winded horse is hardly healed and soone gotten, for his wind is soone broken by hasty running or vehement labour, being fat, or, after he is watered, or, by long standing in the stable without stirring, or by eating dusty hay; which thing ye shall perceive by the rising of his nostrels and his flanks and his tuel, then if he be sore chafed, he will cough and blow thicke.

"It will least appear when he is at grasse or empty bodied.

"The remedies—ye shall take of cloves and nutmegs, three drams, of galingel and Cardamon together, three drams, of soot, of hay seeds, of cummin, more than the other.

"Make all these into fine powder and put it in white wine tempered with a little saffron. Then, put to, so many yelks of eggs as all the other in quantitie, then, temper it all together with the sodden water of liquorice, and make it so thinne that he may easily drinke it with a horne, and tie up his head for an hour space thereafter, that the drinke may descend down into his guts; then, take and leade him forth softly that it may work the better, and not cast it up again, and let him not drink of four and twenty hours after.

"The cure is hard if it has gone long.

"Notwithstanding, there may be diverse remedies given to helpe for a time, as, by drinkes in helping his guts, also in slitting his nostrels to take wind, which perhaps may be a helpe to continue long, and to give him a little boiled wheat for three dayes space.

"THE SPAVIN IN HORSES."

"The spavin be an ill sorenesse to heale, and there bee two kindes of them—the wet and the dry

"The dry is a hard knot, be as bigge as a wallnut, on the inside of the houghes under the joynt, and some will have two spavins appearing on bothe sides of the joynt, which is a hard thing to be healed, and it will cause the horse to halt.

"Some do suppose it commeth by kinde by the horse that begot him, but it cometh by extreme labour and heates, by increasing a humour to the maister veine, in feeding the place with evill humour, and groweth to a hard bone, wherein the cure is hard.

"The cure. Some doe wash it, and then shaves away the haire and opens the skinne upon the veine a handfull above the knee and cuts away the veine betweene both the strings, and, where the highest of the spavin is, there part the skinne the length of a date, and, with a sharp chizell, halfe an inch broad, strike it cleane away the bignesse of an almond, and, take two pennie wight of verdigrease; with a Smithes nervall mixe them together wel, and put it therein, and so heale it.

"The wette or soft spavin groweth likewise on both sides of the hough behinde, and is a soft swelling, and some doe call it a thorow spavin, and commonly it is greater on the outside then on the inside.

"This will bee alwayes soft, and is more easier to be cured, and cures it as the hard spavin."

"CURBE IN A HORSE."

"The curbe is an ill sorenes, appearing on the great sinew behinde, under the hough or camerell place, somewhat beneath the spavin, it will swell on the sinewe, and, after a little labour, he will halt thereon, and then, the more labour the greater griefe.

"And this is gotten by bearing some heavye burden when he is young, or, by some wrynch, or some great straine, and that place will shewe bigger then the other.

"The cure is ill if it remaine long.

"But, take a pint of the lees of wine, with two handfull of wheaten flour with a handful of cummin, then, mixe them all together over the coales, and, being warme, plaisterwise, lay it to the griefe, in changing it for the space of three or foure days, one a day, till the swelling doe goe down; and then draw it with a hote yron all over, and then plaister it with pitch and rozen melted together, and so clappe it to warme.

"Some lay flockes on it of the horse colour, and so plaister it to. Let it remaine till it falle of itselfe away, and keepe his feete dry for nine days or more after, and he shall doe well."

"FOUNDERING IN THE FEETE."

"The signes are, he will, within twelve or fourteen hours after, crouch on his hinder legges, and his fore feet wil be so stiffe that he is not able to move them, and go as though he could not wel tread on the ground, and ready always to stumble.

"Then shall ye immediately garter each legge, a handfull above the knee or hongh, hard with a list, *i.e.*, a selvidge bandage.

"Then walk and chafe him to put him in a heate, and, when he is warme, let him bloud on both the veines of the breast, and keepe the bloud, and take a quarte or two of that bloud, with two quartes of wheat flower, half a pound of bolearmeniac, half so much of Sanguis draconis (dragon's blood), with five or sixe egges, and a pint or more of strong vinegar; then, mixe them wel together, and chafe all his shoulders, back, loynes, breast and fore legges therewith, and, then walke him on some hard grounde, and let him not stand still, and when all the grease is drie, ye shall chafe him with more, and renew it againe, and so walke him three or foure houres after, and then set him in the stable, and give him a little warme water mixt with some malt, and give him some hay or provender, and walk him again, either within the house or abroad, if it be not too cold.

"And thus ye shall use him for four daies, and when all your ointmente is spente then cloth him warme, and let him stand and lie warme, and let him eat but little meat for foure dayes.

"If he mend not then, it is a signe the humour is in his feet; then must ye take off his shooes and search with your butresse, and pare his soles, afore, in the middle of his toes, till the water and bloud come forth, and so let him bleed wel thereat.

" Then stop it with hogges grease, salt, and bruised nettles, or with turpentine and hogs grease so melted together, and laye to with flaxe, and some do but stop his feete with stampt nettles, salt, and hogges grease, but, first tacke on his shooes with a leather, and then stop him, and put under the shooe a thin peece of stiffe leather to keepe in the stuffe, and let him run to grasse. If ye let him run a quarter he will be the sounder.

" Also, some say, if ye let him bloud soone after he is foundred above his hoofes, that will help him from any further danger.

" Another way. Others do cut the skin on the insides or on the fountaine of his legges, the length of a finger, and fils a hollowe strawe with quicksilver, and make it flie abroad, and so let him remaine till he be whole.

" The Colt Evil."

" The colt evil is an ill disease, and cometh comonly to yong horses, and is by some ranknesse of water and bloud, or else, by boundness of feed stopt, and so corrupteth in the yard ; and, some geldings are troubled therewith as wel as stond horses, specially those which have a string, it wil swell very big and cause his belly to swell.

" The cure. Ye shall wash his sheath with warm vinigir and draw forth his yard and wash it also. Then ride him into some water up to the belly, and make him to swim if ye can in some river, or, ride him deepe in water and turn and tosse him therein, and that will lay the heat of his yard.

" Use him thus once or twice a week and he shall doe well.

" Or, wash his cods with water that kineholme (cow dung) is sod in."

" Fistula in the Horse " (Poll Evil).

" For a fistula in the head some do say :—

" Take the juice of housleeke and dip therein a locke of wooll, and put it in his ear, and bind it fast. Use this once, and ye shall see experiences."

Another. " After ye have cut out all the rotten flesh, bathe it well with the grounds of ale made warme, and then wipe the bloud clean away. Then, take butter, rozen, and frankinsence a little, and boyle them altogether, and, boyling hot, poure it into the wound, use him thus, once a day, and this wil heal it also."

" Lice on Horses."

" There will be horses and mares oft times lowsie, which commeth eyther by povertie, colde, or ill keeping ; and most commonly among young horses, wherein many make small account thereof, because it may be soon cured, yet they may soone die thereof.

" The lice will breed most commonly on the necke.

" If he have lice, ye shall finde them in his fore toppe, and about the eares, on the tayle, and, sometimes over all the body, and they make him very poore and the skin wil cleave to the ribs, and he will bee alwayes rubbing and froting, in breaking all his mane and tayle, so he will eate well and his meat doth not prosper him.

" The cure. Ye shall annoint him with sope and quicksilver mixt well together, and to one pound of sope take half a dram of quicksilver, or the powder of privet leaves mixt with oyle, and, therewithall, to chafe him all over."

" To Stanch Bloud."

" If any blinde unlearned horseleech doe chaunce to let bloud in any place where as the signe or moone hath power thereof, if it bleed much, it shall bee good to binde thereon, of nettles all to, bruised, or stamped horse-dung, mixt with chalke and vinegar, and remove it not for three daies ; or else, to take of burnt woollen cloth, feathers, or silke, or to stampe the herbe Perwincle, and lay it to, or wilde tanzie bruised and laide on.

" All these will doe well to stanch bloud in time of neede.

" Also the coame, *i.e.*, spider's web, above the Smithes forge, clap to, and it will stench."

" Windgall."

" The windgall is a soreness light to heale, it is a bladder full of winde and thin humours, on the sides of the joyntes above the pastornes or fetterlocke, as well behind as afore ; they are like soft bladders under the skin, and gotten by much travell ; they will paine the horse so, that in hard wayes he cannot well go, but halt.

" The cure. Some do pricke it thereon (with a launcet) the length of a beane, where it is highest, and so it will come out, but beware of hurting the sinowes, and ye shall see it like the white of an egge.

" Then, take the yolke of an egge and of oyle of bay, as much as a nut ; mix them together, and plaister it on flaxe, and lay it thereto, and this shall make him whole in a day."

Another, " Take the rootes of Comine and beat them well with a little salt, and then lay it to, and he shall be whole incontinent."

" Splints."

" A splint is the least soreness that is, and alway doeth continue. Many seems to mend it, and they payre it ; it is as well on the outside of the legges as on the inside, and, sometimes they will be as bigge as your fingers, which comes by travelling too young, or by too heavy burdens, or by sodaine starting, and straining his sinewes.

" The cure. Some do heale it by rubbing it with a hazell stick made crosse with nicks, and thereby rub the splint all over crosse.

" And others doe shave off all the haire, and with a sticke cut checkerwise, and then layes tarre thereon, and, rubs therewith, twice a day, all on the splint, till it be cleane gone.

" Some doe say to burne is the best, but, if he be not well healed, he may halt continually after.

" Also, some doe clippe or shave the haire cleane away, on the splint, and then, with an awle, all to pricke it over, so farre as it goeth, and then layes thereon a hoat roasted onion or two, and use it thus sixe or seven days, and it will heale him."

" A Horse Venomed."

" If a horse be bite of adder or snake, ye shall take a live cocke and cleave him in the middest, and, all hote, clap it to the wound.

" Some take but a pigin, and open her, and clap it to, and, thereupon give him drinke made with a pint of strong wine and some salt.

" Also, if the horse have eaten in his meate any hen or chickens doung, it wil cause him to have the bloudie fluxe, or the trenches, which is small wormes, or a crowing in his belly or guts.

" Therefore, keepe poultry out of your stables, if ye love your horses.

"FISTULA IN HORSES."

"A Fistula is an ill soreness to heale, and often times breedeth through gallings and chafing sores, which, for lacke of looking to betimes, it groweth to a fistula.

"The cure. First search it well with an instrument of lead that may bow each way to the bottom of the wound, then, finding once the bottome, if ye can, cut it out round to the bottome with a razor, and take it out. Then, mixe the powder of verdigrease and honey together, and boyle them till that it looks red, and stirre it still for burning to; and, being looke warm, dippe a tent of flaxe therein, and tent him therewith, and lay a bolster of flaxe thereupon; if that will not abide, lay on a plaister of pitch, and sowe it fast crosse thereon with a packe threede, or other such like, with which ye may so tie it, that ye may remove and open it at all times, and see that ye change your tent once a day till it do leave mattering, and, alwayes make your tent less and less until it be healed up, and, in the end sprinkle a little unslecked lime thereon to close it up."

I could quote you many more treatments, but our time is limited, and I hope I have brought to your notice enongh to start a discussion.

I think you will all agree that even in these early days the horse leeches and farriers knew quite a lot about disease, particularly diagnosing disease, though, on our present knowledge, their treatments could not have done much good—especially their medicinal treatments.

Again, I, for one, was under the impression that animal substances were of recent origin, but, as you have just seen, they used biological products prior to the tenth century.

Pain to the animal seems to have been of secondary importance, all they aimed at was to get the animal right, and only in one instance have I met with the use of the word "pain."

I am sorry my paper has been so disjointed, but I cut things too fine, and I have had two other papers to prepare at the same time, so I trust you will forgive its shortcomings.

In closing, I would say that most of the historical data has been culled from Sir Frederick Smith's "Early History of Veterinary Literature"; from Shoshan's article in the *Veterinary Record*, April, 1927; Gibson's "The Farrier's New Guide," 1725; Lawson's "The Modern Farrier," 1827; and the rest, as my title points out, from Mascall's "First Booke of Cattell," 1600.

DISCUSSION.

Mr. S. J. MOTTON opened the discussion on Mr. Masson's paper, in the following terms:—

There is something very intriguing in connection with a dive into the early history of veterinary medicine, and Mr. Masson deserves our sincere thanks for collecting the mass of interesting information which he has presented to us this afternoon. Taking the history back to a point earlier than is dealt with in the paper, we must remember that Nature was successfully dealing, in her own way, with certain wounds, fractures and diseases, long before man stepped in and interfered, first by invoking the aid of the gods—a harmless, if not very successful method—and later by surgical and medicinal methods which were not, and are not, always harmless. This early experience of Nature was fortunate for human and veterinary patients, as their bodies had already acquired a degree of useful resistance both to disease and treatment, thereby allowing the practitioners an opportunity to obtain some credit for what they did.

Primitive man recognised something which should not be overlooked to-day, and that is the advisability in many cases of courting the aid of Nature. It has been said that primitive man took to himself the credit of his successful attempts to work the mechanism of Nature for his own advantage, but when the mechanism did not work, he ascribed the fault to some over-ruling supernatural power. Although we can still profit by the aid of Nature, it is futile to tell clients that a supernatural power is upsetting our efforts when our patients die. They will still think we killed them. The Babylonian king mentioned in the paper, who made a law to the effect that the doctor of oxen and asses who treated an animal for a severe wound, and caused it to die, must pay the owner a quarter of its value, had a brain which was in advance of his day, and which worked like the brains of many people of our time.

I do not know who was the first veterinary surgeon, but there is a record which reads as follows: "And Noah began to be a husbandman, and he planted a vineyard; and he drank of the wine, and was drunken." This does not compel us to think that Noah was a doctor of animals, but he certainly showed a professional eye when he collected the 200 which accompanied him in the ark, and he must have had a very considerable knowledge of veterinary dietetics to have been successful in feeding that weird assembly.

As to the inspection of meat, for the reason that pork was excluded from consumption in the Levitical laws, Moses has been credited with a knowledge of the danger attaching to the ingestion of measled pork, but it is probable that the reason was a purely religious one. Tapeworms were known B.C. 400, but it was not until 1683 A.D. that their animal nature was suspected.

As early as 1363 letters patent of King John decreed against the use of tuberculous meat, but it was not until 1865 that Villemin demonstrated that tuberculosis of animals and human beings could be conferred by inoculation.

A consideration of the prescriptions for medicines used by the early veterinarians shows them, like their contemporaries in the field of human medicine, to have had what we now regard as a disgusting tendency to the prescription of the natural excretions of animals, as medicines. The lough methods they practised were, however, rungs in the radder of scientific evolution, and they have led on to the discovery and use of the sera, vaccines, vitamines, gland products, electro-therapy, agents for the correction of mineral deficiencies, and the array of gland products and other animal extracts of our day.

It is true that their animal extracts were used in a very crude form, but they had not arrived at the stage when the finer products could be obtained and dispensed in the neat little bottles and pellets labelled in the picturesque manner in which we now know them. It does not follow however, that their crude materials always did more harm or less good than some modern products. We must not judge these early doctors of animals too severely.

In another four or five hundred years there may be a meeting of this Association in Taunton, and I shiver when I think of what may be said of some of the literature and practices of 1928.

With the quack animal doctors of to-day, the application of cow dung and squashed snails to wounds of the feet of horses, is still a not uncommon practice. Salt pilchards are still given to pigs, goats are kept among cattle to ward off contagious abortion in the latter and, as Mr. Masson suggests, red herrings can apparently be used not only for political purposes, but also for the treatment of piroplasmosis in cattle.

Looking back over the long history, it is interesting to note that Aristotle, over 300 years B.C., correctly described the dentition of the horse, and in A.D.55, Columella said, "The diseased must be separated from the sound, that not so much as one may come among them which may with the contagion infect the rest." The principle of infection had been established, and the practice of isolation with a view to the prevention of the spread of disease in animals

was carried out at a date earlier than in the case of humau medicine.

Mr. W. N. WRIGHT expressed thanks to Mr. Masson for his valuable paper. He went on to say that on the moors owners of cattle continually used old treatments even now. About two years ago he was called to Ashburton to see a horse which had pleurisy and which before his arrival had been inundated with vinegar, which was poured on from a red-hot brick—not by a qualified veterinary surgeon. A chemist in Paignton had told him he was continually having old prescriptions brought to him, which he could hardly read, by farmers who wanted to have old nostrums made up; and of course it was very seldom he had the things that were put down on the paper, but he put in what he could. His clients were perfectly happy and used to come back for the same stuff. But the great difficulty the chemist had was to make the second lot smell just the same as the first; if the smell was the same the farmer was quite happy.

Mr. E. J. THORBURN also expressed his indebtedness to the speaker, observing that he must have gone to considerable trouble to have compiled so many interesting facts.

Mr. A. G. SAUNDERS said he thought animals of the present day might congratulate themselves that they did not live in the "good old times."

Mr. L. W. BOVETT related that about 12 months ago he was called to see a cow which had lost its cud and the farmer, in all sincerity, asked if it was any good to put a live frog down its throat, as he had heard of a neighbour who did it and as soon as the frog started jumping inside the cow it set the cud working again, and afterwards the animal was quite all right.

Mr. E. W. BOVETT remarked that one heard nowadays of the healing by faith of human beings, and it seemed to him that in the old days cattle had to have faith.

The HON. SECRETARY (Mr. R. B. Nelder) thanked Mr. Masson for having gone to so much trouble to prepare a paper. It was extraordinary (he went on to say) what old "remedies" one often came across even now. He had heard of the use of cow dung poultices for wounds in horses' feet and recently also of a cow with a bad attack of mammitis being rubbed with a stone, the udder getting in an awful state. Another farmer used regularly to bleed his horses twice a year—when they went out in the spring, and again when they came in in the autumn. He abandoned the practice only two or three years ago.

The PRESIDENT (Mr. H. K. Roberts), having added to the previous expressions of thanks to the speaker, said the paper had reminded him of some of the treatments that were administered in South Africa even at the present time. Paraffin oil over there was a "great remedy" for nearly everything, and their methods of giving medicines were very crude. A horse was thrown on the ground and the medicine poured down his nostrils. He thought it was also done in some parts of England at the present moment. In Africa they used very crude things such as tobacco and petrol, and pain did not enter into their dictionary at all; it did not matter how the stuff was given or how the animals suffered. Pneumonia followed in many cases and he could not understand it when it did not happen.

Mr. MASSON, in reply, said another very old treatment for mammitis was to use cold rain water, and without doubt it was good, in the same way as a stone, if not rubbed, would, he thought, do good. Referring to cases of loue, Mr. Masson said he believed in giving vent for the discharges. He took a plough line and smeared about 12 or 18 inches of it with copper sulphate and lard, and pulled it through the bullock's foot. The speaker went on to remark that if a horse picked up a nail the carter always put it in a tin of grease. He wondered why? And why (he asked) goose lard for mastitis? Did it have a specific action?

The Veterinary Record.

29th December, 1928.

Fellow-Members of the Association,

Greeting.

May 1929, for all, be filled with peace and progress and happiness, so that, when ended, each, in retrospect, may regard it with great content.

Your President.

THE NATIONAL HORSE ASSOCIATION OF GREAT BRITAIN.

Sir Walter Gilbey, Bart., presiding at the Council Meeting of the National Horse Association, held at 12 Hanover Square, W.1, on the 13th inst., had pleasure in proposing the election of 29 candidates for membership, stating that the Association was now firmly established and was receiving the support of all interested in the Horse. Applications for membership were being received every day.

Slippery Roads.—Mr. Cecil G. Argles reported that arrangements had been made for Members of the Slippery Roads Committee to inspect a large number of roads that had been reported as non-slippery to horse traffic. In this connection, the Committee will be glad to receive details of further roads suitable for their inspection and communications on this subject should be addressed to the Secretary at 12 Hanover Square, W. The Slippery Roads Committee also intend to interview personally County and Local Surveyors in order to induce them to lay road surfaces which would be non-slippery to all forms of traffic, viz., horses, cattle and motors.

A large number of cases where specific roads had been reported as being dangerous had been investigated in conjunction with local authorities, and it was noteworthy that the surveyors concerned seemed very anxious to co-operate with the Committee in making the roads non-slippery and to receive details of recommended surfaces.

The Master of Foxhounds Association had kindly sent an appeal to all Masters asking them to arrange for a Cap to be taken in aid of the Slippery Roads Fund and several Hunts had already responded to this appeal. A large number of Hunting gentlemen had enrolled as Members and it was hoped that many others would support a campaign which was so essential to the safety and maintenance of Fox Hunting.

Publicity.—Sir Walter Gilbey stated that an illustrated pamphlet had been issued giving details and statistics as well as comparative tables which proved that for short haulage work with frequent halts the horse is the most economical form of transport. A large number of applications had already been received for copies of this booklet and all interested in commercial transport are invited to avail themselves of the pamphlet.

Fifty thousand blotters calling attention to the economic advantage of Horse Transport had also been prepared for issue by those Firms whose material interests were bound up in the continued use of Horse Transport. These blotters would be available for supply at a cost of 20s. per 1,000, or 28s. per 1,000 with the name of an individual Firm printed on each blotter.

As indicating the increasing importance of the Association, its work and the publicity given to its activities, during 1928 between 600 and 700 notices had appeared in the press and between 7,500 and 8,000 letters had been despatched from the Association's office.

Children's Riding Classes.—Thirty-seven Societies had applied for the Silver Medal offered in the Children's Riding Classes at affiliated Agricultural Shows and it was anticipated that other Show Societies would take advantage of this innovation in the near future.

Children's Riding Judges.—A suggestion that a panel of Judges recommended for Children's Riding Classes should be at the disposal of Country Shows had been adopted and a Special Sub-Committee appointed to draw up a list of ladies and gentlemen qualified to act in this connection. The Council were of opinion that the encouragement of Children's Riding Classes was a most important feature of the Association's work.

Bloodstock Breeders Discuss Gland Grafting.

The question of gland grafting with a view to rejuvenation was discussed at a meeting of the Thoroughbred Breeders' Association at Newmarket, when the following resolution was carried: "That this Association recommends that the subsequent offspring of any stallion or mare submitted to the operation of gland grafting, should be ineligible for the stud book."

Rabelais, the famous stallion who was exported from England to France in 1904, was recently operated on at the Alfort Veterinary School by Dr. Voronoff, with a view to restoring his fertility, but the horse died a day or two later.

A horse named Don Zuniga, which had undergone the Voronoff gland operation as a yearling, won the Grand Hurdle race at Auteuil in June last in record time.

British bloodstock experts pointed out, however, that this proved nothing, as the horse's ability as a hurdle racer could only be guessed at in his yearling days, and he might have proved just as good even if he had not been operated on.

ROYAL COLLEGE OF VETERINARY SURGEONS.

Membership Examinations—December, 1928.

List of Successful Candidates.

(Continued from page 1096.)

London.

Class C.	*Class D.*
Balfour-Jones, S. E. B.	Bartholomew, A.
Evans, T. M.	Gilmore, A. E.
Kidd, A. A.	Heathcote, F. C.
Shingler, H. C.	Hole, N. M.
Thomas, D. H.	Holman, H. H.
Reid, N. R.	Messervy, A.
	Reid, N. R.
	Sarwar, S. M.
	*Thomas, A. L.

* denotes 2nd Class Honours.

CLINICAL REPORT.

Paralysis of the Crural Nerve following an attack of Haemoglobinuria.

By Henry Taylor F.R.C.V.S., Haywards Heath.

A very good young farm horse suddenly developed lameness whilst ploughing, and was with difficulty got back to the stable, as the hind legs were almost unable to support the weight of the body. When I saw him shortly afterwards he was standing in a stall, and there appeared to be little the matter with him until we commenced to get him into a loose box, when the left hind leg seemed paralysed and unable to support any weight upon it; consequently the transference from one place to the other was accomplished with difficulty.

The animal lay down immediately on getting there. He continued in the recumbent position for several days, and was treated for hæmoglobinuria, though the symptoms of that disease were not so well marked as I have seen them. The gluteal muscles were not so hard, there had not been very much sweating, and the urine was not so dark as usual. After getting up he was kept in the box for a week or two, and then turned out to grass, being then rather lame on the left hind leg. I did not see him again for some weeks, and then the lameness was very pronounced. The chief noticeable feature about him was a hollow in the muscles in the space formed by the iliac spine above, the patella below, and the femur and hip joint posteriorly; just above the patella the crural muscles had apparently wasted clean away. If the first finger and the thumb were pressed together on the region immediately above the stifle joint to try and grip the crural muscles they met with no opposition, two folds of skin being simply interposed between the digits. The action was peculiar. As the stifle joint could not be fixed owing to the loss of power over the patella, there was a crouching of the hind quarters and flexion of the hock, the articulation being automatically bent when the stifle joint was flexed. One must suppose that, if the paralysis had been absolutely complete, the animal would have fallen over on to that side when attempting to walk. As a matter of fact, he seemed likely to do so at times. Possibly the abductors and adductors of the limb counterbalanced, to some extent, the loss of the power of the crural ones. Another symptom was the position of the stifle joint, which pointed outwards. During progression the leg was drawn farther forward than normal, but directly he tried to put much weight on it he had to hop quickly on to the right leg. The femur could be distinctly felt by pushing the finger in about the centre of the region between the iliac spine and the patella, pointing towards the shaft of the bone.

The crural quadriceps muscles are composed of the rectus femoris, the vastus externus, the vastus internus and crureus, all of which are inserted to the patella. The nerve supply is from the lumbosacral plexus, which is formed from the inferior branches of the last two lumbar and first three sacral nerves. The anterior division of the above-mentioned plexus (after receiving a branch from the fourth lumbar) supplies, amongst other muscles, the crural ones. At its origin it lies buried under the psoas

parvus, descending between that muscle and the psoas magnus to supply the rectus femoris and vastus internus, with branches to the other crural muscles.

Now we know that the psoas magnus and parvus are particularly involved in hæmoglobinuria, but why these two and the gluteal ones should be more prone to the degenerative process which characterises that malady than, say, the muscles of the fore part of the body, passes our present day knowledge. I think we may take it as a fact that the atrophy of the crural muscles is due to destruction of the fibres perhaps from trophic nerve influence, and the point then arises—is it due to an actual poison elaborated during the course of the disease or to pressure on the nerve in the psoas region ?

Here comes the point which I wish to make in connection with this particular case and the purport of this article. Will that horse get better ? To that query I must reply : " I do not know, but I surmise not."

In the course of over thirty years' experience I cannot recall more than two or three cases of crural paralysis (most of my cases of hæmoglobinuria have died or been destroyed) and the termination of these was obscure. If we could collect from the members of the profession a list of, say, twenty or thirty cases with their ultimate end, then we should have some data to go upon when the question, such as I have propounded above, is put to us.

The Swine Fever Order.

Sir Henry Cautley in the House of Commons on December 18th, asked the Minister of Agriculture whether he could give the numbers of recorded cases of swine fever for the last complete year before and the last complete year after the coming into force of the present Swine Fever Order ; and whether, in the opinion of himself and his scientific advisers, the results accomplished towards the stamping out of the disease are worth the large loss suffered by traders and farmers due to the dislocation of trade caused by the requirement of isolation for 27 days.

Mr. GUINNESS writes in reply that the number of outbreaks of swine fever during the year 1921 before the issue of the Regulation of Movement of Swine Order, 1922, and for the year 1927, which is the last complete year since that Order, were 1,285 and 1,794 respectively. " I would point out, however," states the Minister, " that the incidence of the disease fluctuates considerably, and that a truer picture is obtained by a comparison of the average annual number of outbreaks per 1,000 of the pig population for the 14 years while the more onerous restrictions of the 1908 Order were in operation, and for the five years since 1922. These figures are 1.05 and .56 respectively. The Order of 1922 was designed to prevent infected swine spreading disease from market to market, and to cause the minimum inconvenience to the industry. I am satisfied that the Order has had this effect, and I may add that I have received no evidence from any representative agricultural organisation of dislocation of trade on the grounds mentioned by my hon. and learned friend."

ARMY VETERINARY SERVICE.

LONDON GAZETTE. WAR OFFICE. REGULAR ARMY.

Dec. 18th.—Capt. T. F. Arnold to be Maj. (Oct. 15th), and remains secd.

TERRITORIAL ARMY.

Dec. 21—Maj. J. A. Connell, T.D., F.R.C.V.S., to be Lt.-Col. (Dec. 12).

ADMINISTRATIVE REPORTS.

Annual Report, Department of Agriculture, Colony and Protectorate of Kenya, 1927.

The very comprehensive report of the Director of Agriculture, running into 312 pages, printed and published by the Government Press at Nairobi and obtainable through any bookseller at the price of 5s., is now available. It furnishes fine evidence of the high degree to which agricultural and veterinary sciences have now been brought in our overseas dependencies. In this review it is proposed to deal only with that which concerns veterinary science and the livestock industry, forming as it does the major portion of the report. In illustration of the importance of veterinary activity, it is of interest to record that out of a total expenditure of £117,681 for the fiscal year under review, £71,778 was on veterinary account, of which £22,066 was in appropriation of Administration and Executive Service, £29,888 in Veterinary Research, £6,516 in Rinderpest Service, £11,998 for Services in Native Reserves and £1,310 towards a Veterinary Training Depôt. Against this, there is a total revenue accruing to the Agricultural Department of £34,527, of which £22,400 is from veterinary inoculation fees and £4,974 for the sale of sera vaccines and labaratory products.

An idea of the number of livestock in the Colony will be gathered from the following table, which, so far as native-owned stock is concerned, can only be regarded as approximate :—

Class of Animal.	European. Number.	Native. Number.	Remarks.
Cattle ...	215,650 (*a*)	3,260,000	(*a*) Breeding Stock,
Horses ...	2,137	200	107,434
Mules ...	719	300	Oxen, 108,213
Donkeys	1,046	35,000	
Sheep ..	242,271 (*b*)	2,600,000	(*b*) Wool-bearing,
Goats ...	3,697	3,600,000	209,299
Pigs ...	12,954	—	Native, 32,972
Camels ...	—	60,000	
Poultry	43,988	—	

Cattle owned by Europeans have increased by 1·04 per cent. over the previous year and wool-bearing sheep by a noteworthy figure of 28·52 per cent. Pig-breeding and feeding are also on the increase and poultry, as a side issue, is becoming more popular. A very large increase (30·25 per cent. over 1926) in the amount of fresh milk sold is shewn, with, however, a considerable reduction in the quantity of butter produced. As shewing the extent of farming operations, approximately 5,000,000 acres are allotted for occupation by Europeans and, in addition, about 2,000,000 acres are available for alienation. Of the area allotted, 4,737,920 acres are under occupation, and the total area cultivated is 512,543 acres.

The Veterinary Staff of the Department on the 31st December, 1927, in the Administrative and Executive Division, consisted of a Chief Veterinary Officer, a Deputy Chief Véterinary Officer, three Senior Veterinary Officers, nine Veterinary Officers, seventeen Stock Inspectors,

and seven temporary Stock Inspectors. The Division of Veterinary Research consisted of one Chief Veterinary Research Officer, one Assistant Chief Veterinary Research Officer, two Veterinary Research Officers, one Laboratory Superintendent, eight Laboratory Assistants and nine others—a total, therefore, of eighteen qualified Veterinary Officers in the Colony. Seven new Veterinary Officers have been asked for during 1928.

Field work in connection with the control of disease by the Veterinary Department is described under the various specific disease headings and brief allusion to them is herewith made :—

(*a*) *Rinderpest.* "The simultaneous method of inoculation of virulent blood and anti-rinderpest serum has been accepted by this Colony as being the only means of control to combat the outbreak and spread of rinderpest with any permanent success." . . . . . "Double inoculations were commenced in this Colony by Montgomery in 1912. Field double inoculations have had varying successes and failures, but thanks to improvements brought about by research officers, principally Walker, a system of double inoculation is practised now which is almost reaching the perfect stage."

During the year 156,560 double inoculations, 3,676 virulent blood tests, and 11,739 serum-alone inoculations were carried out, and the total mortality was 3,734. The demand for control by the douole inoculation method has far exceeded the scope of the available staff. 14,446,250 c.c. of anti-rinderpest serum were issued during the year. An alteration in the technique of inoculation is recorded, *viz.*, the infection of the virus makers by a subcutaneous inoculation of nasal discharge from an infected animal, and thereby avoiding the unreliability and delay caused by infecting virus makers by contact. High mortality from the double inoculation is now exceptional, though in a colony where tick-borne disease prevails, there must remain the difficulty in obtaining blood free from piroplasms. It is considered that the Colony should follow in the footsteps of India and Egypt, and ask the research laboratories to be responsible for the control and issue of a suitable rinderpest virus.

(*b*) *East Coast fever.* "East Coast fever is the most dangerous in the Colony, and the losses from this disease are enormous." The disease is spreading rapidly taking an increased toll of cattle each year. The success of settlement and the dairying industry is largely dependent on its control. At the last Stockowners' Conference resolutions were passed pressing Government to perfect means for eradicating the disease and to adopt an immunization service. The report states that "the results to date show that inoculation can be carried out with the prospect of conferring a variable immunity on approximately 80 per cent. of susceptible cattle." In the opinion of the Acting Chief Veterinary Officer, however, immunization of itself cannot be employed to eradicate the disease, the only effective means to that end being the destruction of the transmitting agent, *viz.*, various species of ticks, by short-interval dipping, combined with thorough hand dressing and fencing. Co-operation between veterinary authorities and stock owners is necessary, and the benefits of a dipping and fencing scheme for eradication purposes have yet to be brought home to the understanding of the native stockowner. Maintenance of tick life is perpetuated by small game and vermin. Government has decided to pass a law whereby compulsory dipping and fencing will be enforced on infected farms in certain areas. Returns show that during the year 162 equines, 32,727 cattle and 41,238 sheep and goats were passed through Government Dipping Stations.

(*c*) *Contagious bovine pleuro-pneumonia.* This disease showed a considerable increase during the year due, to infection amongst native stock in certain native reserves. For unknown reasons the technique of diagnosis and inoculations in these reserves would appear to have broken down. The vaccination technique at the present time consists of two vaccinations with a mild strain of vaccine, with a fortnight's interval between them, and a third vaccination subcutaneously behind the shoulder, with a strong strain of vaccine three weeks afterwards. 12,170 full vaccinations were carried out during the year. A free issue of vaccine to stock owners is made.

(*d*) *Bovine infectious abortion.* This disease is spreading considerably, but infection on individual farms is small in comparison to general incidence. The methods of combating it in the Colony are by agglutination test and isolation. A few practical words of advice to stockowners are given in the report.

(*e*) *Sterility in cattle.* "Breeding for milk production is becoming more intensive each year, but progress is impeded by sterility." The nutritional aspect of sterility is discussed, and the main factor of uterine infection from dirty paddocks and bomas explained.

(*f*) *Trypanosomiasis.* Outbreaks showed a marked increase over previous years and all those reported were on European farms, where tsetse flies were not known to exist. It is explained, however, that very few tsetse flies are sufficient to start an outbreaks and that other biting flies can keep alive and propagate the disease, *i.e.*, stomoxys, tabanidæ, hæmatopota, hippobosca, etc. Stomoxys is abundant everywhere. Point is made of mechanical transport as a means of conveying tsetse flies through miles of country, also ox transport in logging, shooting expeditions, etc., illicit movement of stock, movement of large game such as elephant, migration of herds of game in search of water, all being common means of spread. Mortality in infected herds is usually high, and none of the medicinal agents tried for cu · can be said to be of practical value in the field.

(*g*) *Anthrax.* Twenty-seven outbreaks came under notice. The disease is very much less virulent than in Great Britain. Cases usually take the form of large localised œdematous swellings on different parts of the body and spontaneous recovery is frequent. 14,078 doses of preventive vaccine were issued from the Veterinary Laboratory, Kabete, during the year.

(*h*) *Black quarter.* Twenty-two outbreaks were reported. A liquid vaccine is now being produced at the laboratory and the old powder vaccine is being eliminated. 31,400 doses of both liquid and powder vaccine were issued by the laboratory during the year.

(*i*) *Swine fever.* Spontaneous outbreaks of swine fever frequently occur on farms, and the source of infection is usually obscure.

(*j*) *Ulcerative lymphangitis.* This condition constitutes the worst equine scourge of the Colony. The source of infection is unknown, and different treatments, including inoculation, are adopted with a varying degree of success.

(*k*) *Epizootic lymphangitis.* Seven cases were confirmed during the year.

(*l*) *Horse sickness.* Eight cases were reported, a decrease on previous years —believed to be due to shortage of rain.

(*m*) *Canine piroplasmosis.* One hundred and forty cases were treated by subcutaneous injection of trypan-blau, which gives the best results in this tick fever. Stovarsol by itself did not prove a specific cure, but in conjunction with trypanblau assisted recovery.

Veterinary Laboratory.

Technical routine work is increasing yearly, and successful research continues the increase. In addition to an extensive list of laboratory products, 9,036 slides and specimens were examined during the year.

Experiment and investigation chiefly refer to rinderpest, East Coast fever, lung diseases of sheep and goats, East African swine fever and poisoning by acokanthera, and a summary of important findings under these headings is herewith given :—

(*a*) *Rinderpest.* Owing to the danger of redwater and gall sickness infections being set up in cattle undergoing rinderpest inoculations (simultaneous method), the following methods were investigated :—

(1) The substitution of peritoneal washings for virulent bovine blood.
(2) The substitution of nasal secretion for virulent blood.
(3) The substitution of the blood of a goat reacting to rinderpest, for virulent blood.
(4) The use of virus makers (cattle) born and reared on estates where dipping is regularly carried out.

The substitution of fresh peritoneal washings for virulent blood is not generally recommended, owing to the difficulty of obtaining washings free of red cells and consequent risk of washings producing red water and gall sickness. Even if fresh washings are filtrated their substitution is not recommended, owing to the varying results in obtaining a virulent filtrate. Further transmission experiments are necessary to determine whether fresh nasal secretions can be substituted for virulent blood. The indications are that it may be substituted and risk of transmission of redwater and gall sickness excluded, but the obtaining of sufficient nasal secretion for the immunisation of large numbers of cattle would present some difficulty. The first passage of bovine rinderpest virus through a goat produces an attenuation of the virus and is unsuitable for rinderpest immunization. A percentage of young stock born on estates where dipping at three days' interval and hand dressing was practised escaped redwater and gall sickness, but those of the same p. od without hand dressing, and those of a seven days' interval and without hand dressing did not escape. The value of vaccination with extracts of organs, *i.e.*, spleen, pulp, liver extract, small intestine extract, muscle pulp, collected from animals reacting to rinderpest, was investigated. "The data at present available is insufficient to draw conclusions, as to the nature of the immunity conferred by inoculation of more or less virulent extracts. Inoculation with non-virulent extracts does not confer a resistance to simultaneous, or six days later, inoculation of virus, but apparently some resistance to contact infection."

(*b*) *East Coast fever.* "The experimental work was undertaken chiefly with a view to elaborating a method of inoculation which would produce the greatest percentage of reactions to East Coast fever, and the lowest death rate from inoculation and subsequent exposure to natural infection." Intravenous inoculation of spleen pulp and simultaneously subcutaneous and intradermal inoculation of spleen pulp mixed with blood gave the largest percentage of reactions, *viz.*, 87 per cent. approximately. . . . An original inoculation did not necessarily confer a complete resistance against re-inoculation. . . . . Re-inoculation does not confer a higher resistance to natural infection. . . . On estates where losses are occurring from East Coast fever and no facilities exist for controlling the disease, an original inoculation by the method which produces the largest percentage of reactions and most resistance to natural infection, *viz.*, one intravenous inoculation of spleen pulp and simultaneously, subcutaneously and intradermally, blood mixed with spleen pulp, is indicated. . . . Immunity conferred by recovery from natural infection is not always absolute and complete against natural re-infection

(*c*) *East African swine fever.* Vaccination with extracts of spleen would not appear to be of any practical value in prophylaxis. "Animals which survived inoculation with an attentuated virus and a non-virulent or attenuated extract were not protected against a non-attenuated virus."

(*d*) *Infectious pleuro-pneumonia of sheep (Laikipia lung disease); Kikuyu disease of goats; Infectious pleuro-pneumonia of goats.* Great prominence is given in the body of the report to description and differentiation of these ovine and caprine diseases, and their epidemiology and exact relationship would appear to require further clearing up. The first chiefly affects new born lambs and in some years mortality is as high as 75 per cent. The primary bacterial agent is a small pleomorphic bacillus, a facultative anærobe, but in the majority of animals there is secondary bacterial contamination. The manner of infection under field conditions has not yet been finally explained, but "it is generally accepted that most primary pulmonary diseases are contracted through the respiratory tract." Satisfactory results from a prophylactic vaccine are reported by owners. Adult sheep possess a fairly strong immunity, but "chronic lungers" are probably responsible for the maintenance of infection in a flock.

The "*Kikuyu disease of goats*" characterised by progressive weakness and a profound anæmia, attacks animals of all ages and sexes, and in many respects resembles "Takosis" prevalent in the United States of America. The actual causal factor has not yet been determined. *Infectious pleuro-pneumonia in goats*, which prevails in Uganda, Tanganyika and the Congo, has been confirmed in Kenya, but little is known as to its etiology. Whether or no it bears relation to the "Laikipia lung disease" of sheep would appear to require further investigation, poisoning by plants and leaves of certain trees has come under investigation, particularly by *Acokanthera schimperi* and *longiflora*, which form the basis of the famous Kamba

arrow poison. It is interesting to note that the fruit of these trees is non-poisonous, but the leaves, eaten by animals in times of drought, produce a fatal acute gastro-enteritis. J. M.

The Annual Report of the Veterinary Department, Uganda Protectorate, 1927.

Speaking generally, the work for the year is one of satisfactory progress. Rinderpest has created anxiety, but checking it at the borders of settled areas was successful. The work on tsetse control and investigation, and the treatment of trypanosomiasis in the field, marks definite progress. Natives who a few years ago were violently opposed to veterinary measures in respect of this disease, now realise the benefits of constant assistance. A system of milk analyses was inaugurated in three of the Provinces with very interesting results.

The Staff of the Department consists of a Chief Veterinary Officer, an Assistant Chief Veterinary Officer, two Senior Veterinary Officers, eight Veterinary Officers, a Veterinary Pathologist, a Laboratory Assistant, two Assistant Livestock Officers, ten Stock Officers, two Indian Veterinary Assistants, three Senior Clerks and four Junior Clerks.

Animal Husbandry.

The number of cattle in the Colony in 1927 amounted to 1,846,514; the increase from 700,764 in 1921 and 1,399,028 in 1924 is evidence of the benefits of both disease and stock control. A considerable trade between Provinces and Districts is maintained and movements are under a permit system. The policy in force is the improvement of native breeds, but of imported animals for crossing with Buganda cattle, the Ayrshire seems hardier and better able to endure sun exposure than either Shorthorn or Friesland. The importation of Angora goats is under consideration; the drawback appears to be the menace of epizootic caprine pleuro-pneumonia. It is anticipated that the export value of hides and skins will approximate £120,000 for the year. General propaganda work is being conducted in the preparation of ghee, the consumption of which is increasing. The analyses of milk conducted by the Veterinary Pathologist disclose a surprisingly high fat content in the milk of the Ankole District of the Western Province, the average being 6·09 per cent., and the report states that over one half of the Uganda milks contain above 5 per cent. fat.

Observations on Disease.

(*a*) *Rinderpest.* "No serious mortality has occurred in the Protectorate during 1927, the total deaths from this disease being approximately 7,000, which compares favourably with the average loss of 70,000 animals per annum for the period 1912 to 1920." 35,408 double inoculations and 1,241 serum alone inoculations were carried out, particularly in the Bugishu and Budama Districts of the Eastern Province where the density of the cattle population is one animal to approximately 6·5 acres. A new departure in serum production is recorded. In the above-mentioned districts it was shown that "animals which had experienced severe reactions from virus-serum inculations could be bled without hyper-immunization and the serum obtained from these could be used in practicable doses for ordinary immunization work. Three thousand five hundred doses were obtained in this way in the inoculation camps at no expense to Government. The mortality amongst the animals unimmunized with the 'field' serum was 6 per cent. . . . . The procedure should be specially valuable in organised anti-rinderpest campaigns."

(*b*) *Pleuro-pneumonia contagiosa bovum.* The disease has been confined almost entirely to the Teso District of the Eastern Province. Anti-pleuro-pneumonia inoculations in that district numbered 39,951. A plan now adopted in control is to have inspections of carcases at the various main slaughter markets, and in the event of disease being discovered, to trace herd, place in quarantine, and subject it to a series of three vaccinations.

(*c*) *Trypanosomiasis.* The disease is mainly due to *T. congolense* infection. No widespread mortality appears to have occurred. Treatment by antimony potassium tartrate was successful when it was possible to carry it out, and native owners heartily welcome it. The sodium salt was experimentally used, but results indicated the greater efficacy of the former drug.

(*d*) *Blackquarter and* (*e*) *anthrax* occurred, but not to any serious extent.

(*f*) *East Coast fever and redwater are considered enzootic in the Protectorate.*

(*g*) "*Kawali,*" a skin disease of cattle, appears to be common. It is considered to be non-contagious, but further investigation is proceeding.

(*h*) *Caprine contagious pleuro-pneumonia.* Heavy mortality occurred in goats imported from Kenya Colony for the purpose of slaughter, but no disease is recorded with resident animals. As there has been confusion regarding the similarity of this disease with the lung disease of sheep in Kenya Colony, the Veterinary Pathologist on a recent visit to Kenya Veterinary Laboratory and after having "had the opportunity of seeing infected sheep and the lungs of sheep which had died of a pneumonia with pleurisy, came to the conclusion that pneumonia in goats in this country is not the same disease which affects the sheep in Kenya Colony, but similar to an infection which exists in Belgian Congo, and has been reported in Tanganyika Territory and also in Kenya Colony."

(*i*) *Fowl typhoid.* A vaccine prepared by the Veterinary Pathologist is reported to have been a complete success in eradicating the disease, but for which heavy losses would have ensued.

Glossinæ Investigations. Investigation and demarkation work proceeds with appreciable success, the main objective being the reclamation of valuable grazing grounds now rendered useless by the pest *Glossina morsitans.* It has been definitely established that the fly has evacuated large tracts of country which it occupied in 1915—1920. To guard against the extensions of tsetse to wider areas through the medium of motor vehicles, such vehicles on leaving an infected area are required to undergo fumigation in a "smoke" house. In projected road construction detailed fly surveys and tests are conducted by the Veterinary Department, an important item in preventing dissemination.

Work of Veterinary Pathologist.

Remark is made of the inadequacy of the Laboratory, and of the necessity for shelter for animals under experiment. Plans for a new Veterinary Laboratory are in process of preparation. Qualified assistance is also deemed necessary as research work is subject to interruption when the Veterinary Pathologist is engaged on field investigations.

(*a*) *Anti-rinderpest serum.* An important series of experiments was conducted in the field to determine the comparative potency of serum obtained from immuned and hyperimmuned animals, as it has been claimed that the serum of an animal which has only been immunized possesses a titre of such potency that counteraction of rinderpest virus can be effected, and that for all practicable purposes in cases of emergency, in out of the way districts, it could replace the hyperimmunized serum obtained from laboratories. The results of the experiments established (a) "that, given favourable conditions, serum could be manufactured at the site of an attack under field conditions"; (b) "The serum from animals recovered from a natural attack of rinderpest was sufficiently potent to give protection when injected in doses of 40 c.c. for cattle varying up to 500 lbs. estimated weight, simultaneously with 2 c.c. virulent blood." The experiments are sufficiently encouraging to be tried out on a larger scale, and it seems certain that the titre of the serum depends on the severity of the reaction experienced by the serum-producing animal.

(*b*) *Trypanosomiasis.* The drug halarsine, which on injection is reputed to cause a sudden increase of trypanosomes in the peripheral circulation, was tried as an aid to microscopic diagnosis, but results are not very conclusive. The formal gel test (gelation of diluted serum by commercial formalin), stated to have been proved valuable in diagnosis of the disease in camels and in human infections, was tried in caprine and bovine trypanosomiasis, and shown to be unreliable. An outbreak of Trypanosomiasis on Buvuma Island, Lake Victoria, is of interest as the causal organism was *T. congolense*, and the only species of Glossina believed to be present was *G. palpalis*, which has not previously been recorded in the Protectorate as a natural vector of *T. congolense*.

(*c*) *Contagious abortion.* Agglutination tests for contagious abortion were conducted, though it has never been definitely proved that this contagious disease exists in the Protectorate. There are many factors of a non-contagious nature which may bring about abortion. Other specific diseases enquired into in the Laboratory were spirochætosis, anthrax, blackquarter, pleuro-pneumonia of goats, fowl typhoid, piroplasmosis of dogs and skin diseases of cattle. As previously remarked, much good work was done in relation to milk analyses. J. M.

Personal.

We are glad to note that Mr. R. F. Bennett, son of Mr. Ralph Bennett, F.R.C.V.S., of Romford, has secured an entrance exhibition, from the Royal Liberty School, Romford, for History, to Magdalene College, Cambridge.

The Eradication of Bovine Tuberculosis.*

By A. M. Trotter, M.R.C.V.S.,
Chief Veterinary Inspector, Glasgow.

Columella, in his work, "*De re Rustica*," describes a disease affecting the lungs of cattle in the following words: "*Est etiam illa gravis pernicies, cum pulmones exulcerantur, inde tussis et macies et, ad ultimum, phthisis invadit.*"

The disease, from the above description, is believed by many to have been tuberculosis. Be that as it may, tuberculosis has been recognised for ages as a scourge, and long before Koch made known in 1882 his discovery of the *Bac. tuberculosis* as the causative agent of this disease many scientists had sought to elucidate its many problems. The discovery of the *Bac. tuberculosis* not only solved several of these problems, but it permitted further investigations to be undertaken on more scientific lines.

It has been proved beyond cavil that tuberculosis is a disease which can be transmitted from animal to animal and from animal to man. Investigation has laid to rest the bogey that the offspring of tuberculous parents must sooner or later also fall a victim to the disease, and has proved this one time belief to be false and untenable, and that, on the contrary, it is possible to rear such offspring free of the disease. It is true that the disease is transmitted occasionally to the fœtus of the cow, but the percentage of these cases is small, and need not be considered where preventable measures are adopted.

Tuberculosis is essentially a preventable disease. It cannot be emphasised too strongly that tuberculosis can be prevented or, in other words, eradicated. The old adage, "Prevention is better than cure," is still true, and, so far as tuberculosis is concerned, prevention is infinitely better than cure, as many so-called cures are not permanent. It is true that this knowledge has been employed by a few of our more enterprising stockowners, with the result that tuberculosis has been eradicated from their herds. The eradication of this disease from a herd is not only a personal gain, but a national gain. It proves conclusively that if the disease can be eradicated from one herd, it is possible to eradicate tuberculosis from every herd in the country. The attainment of this laudable object, however, means determination and perseverance on the part of stockowners, and the hearty co-operation of the Government, the stockowners, and the veterinary profession. It may be urged that this is a matter which concerns only the stockowners, but this is not so, as it is of vital importance to every man, woman and child in this country. The transmissibility of tuberculosis from animal to man has been proved too conclusively to permit of any dubiety, and, therefore, the prevalence of tuberculosis among the bovine population may mean the illness, the disability, and even the death of any one of us.

Statistics prove that this in no alarmist statement. It is unnecessary to quote the results of the innumerable investigations which have been undertaken by scientists all over the world, and the following table compiled from data given by Dr. Griffith, the recognised authority on this subject, will suffice to show that the menace to man is real, and cannot be ignored.

* Report submitted to the Corporation, as the Local Authority of the Burgh of Glasgow, under the Diseases of Animals Acts, on 4th October, 1928.

	Number of Cases Examined.	Bovine.	Percentage Bovine.	Percentage Bovine in Age Groups.			
				0-5	5-10	10-15	15 and over.
Tuberculosis of glands of neck	116	54	46·5	87·5	61·3	37·0	25·0
Bones and joints (England)	476	87	18·3	28·7	23·1	9·5	6·4
Bones and joints (Scotland)	28	8	28·6	37·5	33·3	—	—
Lupus	126	64	50·8	69·0	42·5	60·0	17·6
Scrofuloderma ...	52	20	38·4	58·3	44·4		7·7
Royal Commission Series	46	19	41·3	45·7	27·3	—	—
L.G.B. Series	113	20	17·7	21·3	13·4	—	—

These results show (1) that the frequency with which human and bovine affections occur varies with the organ affected and with the age of the patient; and (2) that the incidence of bovine infection is highest in children under five, and in those forms which affect the glands of the neck and abdomen. In these forms the proportion may reach over 80 per cent. It is estimated that bovine tuberculosis accounts for about 3,000 deaths per annum, or 6·4 per cent. of all deaths from tuberculosis of all kinds.

Consideration of this question cannot, however, be restricted to the number of deaths due to bovine tuberculosis, but must also include the vastly greater number infected, many of whom undergo lingering illness.

The *Bac. tuberculosis* isolated from lesions present in man, cattle and birds has been studied, with the result that it is now possible, by determining the characters of the bacilli present in the lesion, to state whether the organisms show the character of the human, the bovine, or the avian types. These three types are members of a common family although they show different characteristics. The bovine type, for instance, is more virulent than the others when inoculated into test animals.

Undoubtedly milk and its products are the chief means of transmitting the disease from the bovine to man. All breeds of cattle are subject to tuberculosis, but the disease is not uniformly distributed throughout the country. In certain districts the percentage of cows affected with tuberculosis is high. Every cow affected with tuberculosis cannot, however, be regarded as an actual present danger to man, but every such cow must be regarded as dangerous, because at any moment it may become an actual menace through the extension of the disease. It is indeed fortunate for mankind that only a small percentage of tuberculous cows yield milk infected with the *Bac. tuberculosis*. On the other hand, the passive menace imperceptibly becomes an actual menace, and some time elapses before the dangerous condition can be detected. During the intervening period between the actual menace stage and the date of detection the cow continues to yield milk infected with tubercle bacilli. The cow is now in a condition to transmit tuberculosis to the members of the human family who unwittingly consume its milk.

The Tuberculosis Order of 1925 empowers a Local Authority, through its Veterinary Inspector, to slaughter a cow—

(*a*) suffering from tuberculosis of the udder;

(*b*) giving tuberculous milk;

(*c*) suffering from tuberculous emaciation; and

(*d*) suffering from a chronic cough and showing definite clinical signs of tuberculosis.

Prior to the coming into operation of the Tuberculosis Order the powers possessed by the Corporation were contained in the Glasgow Police (Amendment) Act of 1890. This Act did not empower the Corporation to order the slaughter of any animal. The sections of this Act relating to the milk supply merely authorised the Corporation to order the removal of any cow kept for the supply of milk for human consumption suffering from tuberculosis or any disease which might render the use of such milk for human consumption dangerous or injurious to health.

Under the Tuberculosis Order of 1925 a cow falling to be included under (*a*), (*b*), (*c*), or (*d*) can now be slaughtered.

The Tuberculosis Order and the Milk and Dairies (Scotland) Act came into operation on 1st September, 1925. The Order and Act are designed to work in unison. Under the Act, Section 3 (1), every Local Authority may, and when required by the Board shall, appoint one or more members of the Royal College of Veterinary Surgeons to act as Veterinary Inspector under this Act, and Section 4 (2) provides that "It shall be the duty of the Veterinary Inspector from time to time, and once at least in every year, to inspect the cattle in every dairy in the district, and to report to the Local Authority the result of every such inspection."

Under the powers contained in the Tuberculosis Order a considerable number of cows are slaughtered annually throughout Scotland. It must be admitted that the slaughter of cows falling to be included under the classification (*a*), (*b*), (*c*), or (*d*) of the Tuberculosis Order is a step in the right direction.

During 1926, 1,852 cows were slaughtered at the instance of the Local Authorities in Scotland under the powers contained in the Tuberculosis Order. Many cows, however, the condition of which warranted their inclusion under this Order, were not reported by their owners to the Local Authorities, and in consequence were not dealt with by the official Veterinary Inspectors. The large number of cows slaughtered during 1926 does not therefore represent all the dangerous cows, and the meagre protection afforded by the Order is stultified by the apathy of some stock-owners. It is certainly satisfactory to state that throughout Scotland 1,852 cows were slaughtered, but it is equally unsatisfactory to know that an approximate number of diseased animals will require to be slaughtered in the succeeding years. A constant crop of infected animals will occur under present conditions, and will continue until the eradication of the disease is an accomplished fact.

The objective of the Tuberculosis Order was not the eradication of the disease, but the slaughter of animals the condition of which warranted them being dealt with under this Order. Sooner or later a determined effort must be made to eradicate bovine tuberculosis, and the sooner this campaign is made the better it will be for the country. The eradication of bovine tuberculosis must be a gradual process, as the enforcement of extreme measures would lead inevitably to abject failure and chaos. It cannot be too strongly emphasised that there is no short cut to the attainment of this object, and it can only be accomplished by patience and determination.

Denmark was the first country to adopt measures for the eradication of bovine tuberculosis. These measures were commenced at the instigation and under the supervision of Professor Bang of the Royal Veterinary College of Copenhagen. Bang's method was first employed at Thurebylille, in Seeland, in 1892. The herd on this farm comprised 208 head of cattle. On the application of the test for the first time it was found that about 80 per cent. of the adults, 40 per cent. of the steers and heifers, and 46 per cent. of the calves were affected with tuberculosis. The non-reacting animals were separated from those reacting by a tight wooden partition, which had been erected to divide the cowshed. The calves were housed in a separate compartment, to which they were removed immediately after birth. These calves received the colostrum drawn from their dams, but were afterwards fed either on raw milk drawn from cows which had not reacted to tuberculin or with milk which had been heated to a temperature sufficient to destroy the *Bacillus tuberculosis*. Two sets of attendants were employed, one attending the healthy and the other the unhealthy section of the herd. The healthy section of the herd was tested once or twice each year, and any animal found to react was immediately removed to the unhealthy section of the herd. Even at pasture the healthy was kept separate from the unhealthy.

The practicability of the system was soon proved, as the calves born of reacting dams were in nearly all cases found on being tested with tuberculin to be healthy, and they continued to remain healthy. The percentage of the animals in the healthy section found to react at the periodic retest varied from 1 per cent. to, in a few instances, 9 per cent. The higher percentage was traceable to a carelessness on the part of the attendants. The number of the healthy section increased annually, until eventually the disease was entirely eliminated. This herd is subjected to an annual test, and to-day is free of tuberculosis. Many such cases can be quoted. For instance, a farmer in Seeland had, in 1895, twenty-two (22) head of cattle. When this herd was first tested all animals reacted, with the exception of an old cow and four calves. The farmer isolated the four calves in a small shed in another part of the farm premises. In the following years all calves were isolated immediately after birth, so that three years later the healthy section of the herd comprised twelve young animals (calves and heifers), of which, on being tested, one was found to react. During the following years the healthy herd was subjected to an annual test, with negative results. The number of the sound section of the herd gradually increased to thirty (30), whilst the number of diseased members decreased until, in 1902, the herd was free from tuberculosis. The change from a grossly-infected herd to one entirely free of tuberculosis was effected by the expenditure of some 200 Danish crowns (equivalent to about £12 10s.), the sum incurred in effecting the necessary alterations in the cowshed. The farmer tended the cattle—first feeding and cleaning those in the healthy section, and afterwards the reacting animals. In a letter to Professor Bang he stated :—" If I had not taken this step I probably would have been ruined. The whole thing is not difficult. Anyone can do it if only he has confidence." This herd has been tested several times, and on every occasion no member of the herd has reacted to tuberculin.

It is stated that a healthy herd produces more milk than an unhealthy one, and figures are available proving this assertion. In one instance, a farmer found, after his herd had been freed of tuberculosis, each cow produced, on the average, 78 lbs. more butter per annum, although the animals were given the same rations. Another farmer stated that his income per cow was increased by 50 Danish crowns per annum after he had eliminated tuberculosis from his herd. A farmer, therefore, has a double inducement for eliminating tuberculosis, as, not only has he diminished his risk of loss through illness and death, but at the same time he has increased his income, through the greater yield of milk from his herd. It has been demonstrated that the farmer or stockowner who holds a breeding herd can eliminate tuberculosis from his herd, provided that he exercises care and perseveres. The method which has proved so successful in Denmark can be successfully followed by any breeder in this country.

Many stockowners in Scotland are prepared to adopt eradication measures provided they secure the hearty co-operation of the Ministry. The eradication of the disease must commence with the breeding herds, and it is necessary that the premises be suitable or can be made suitable for the isolation of the affected animals. The actual work of eradication could as a rule be carried out by the local veterinary practitioners, under the supervision of either an official of the Ministry or the County Veterinary Inspector. The stockowner and the veterinary practitioner would, of course, be bound to carry faithfully into effect all instructions issued by the Ministry. Failure on the part of the stockowner or the veterinary practitioner could be dealt with in a drastic manner by the Ministry, because in the case of the stockowner eradication measures can be discontinued and the services of the veterinary practitioner can be dispensed with.

At present tuberculin can be obtained from different sources. Tuberculin must play an important part in the eradication of tuberculosis, and it is therefore necessary that it be always fresh and of uniform strength. The State ought to prohibit the indiscriminate sale of tuberculin, and control its manufacture and distribution. It has been proved that tuberculin is of great value as a diagnostic agent, and by its use it is possible to differentiate between the affected and the non-affected members of a herd. In this way it is possible to segregate affected animals. At present a cow cast from a herd on account of having reacted to tuberculin is invariably sent to market. This animal may be sold for slaughter, but, on the other hand, it may be purchased by a dairy farmer as an addition to his herd. If for the latter purpose, then a known tuberculous animal is without let or hindrance permitted to continue as a producer of milk for human food. As I have already shown, this animal is a menace to the human population of this country. All reacting cows, therefore, cast from a herd from which the disease is being eradicated ought to be slaughtered by the Ministry, and the owner paid the current price ruling in the nearest meat market for a similar grade of carcase.

Within recent years a vaccine has been introduced by Calmette and Guerin to render animals immune against infection by the *Bac. tuberculosis*. At present the protec-

tive power of this vaccine is being tested, but time must elapse before the efficacy of this material can be determined.

If we are to attain the position of a Grade A nation it is necessary that our milk supply be Grade A in quality. Much of the milk sold in populous centres in this country is, before being offered to the public, subjected to a heating process. The primary object of the milk vendor in heating the milk is to prolong its life, but, unconsciously, he is also destroying or impairing the vitality of the pathogenic organisms which may have gained access to the milk. Many persons connected with the dairying industry regard this heating process as the corrective of all ills, consequently they devote little or no attention to cleanly methods. Such erroneous views cannot be too strongly condemned, as no system of heating has been devised which can rectify the evils accruing from slipshod methods. Every precaution ought to be taken to prevent the contamination of milk until it reaches the table of the consumer. At present all milk sold in this country is graded and sold either as—(1) Certified; (2) Grade A (T.T.); (3) Grade A; (4) Pasteurised; and (5) Unclassed. The bulk of the milk sold in this country falls under the classification of unclassed, but much of it could, with a better system of supervision, be raised to the 3rd class, *i.e.*, Grade A. No milk ought to be permitted to be used for the food of man unless it conforms to the conditions for the Grade A class. Under the present regulations it is stipulated that milk of Grade A quality must contain at least 3·5 per cent. of butter fat, not more than 200,000 bacteria per cubic centimetre, no bacillus coli in 1/100 cubic centimetre, and every cow producing this milk must be examined not less than three times in every year, at intervals of not less than three and not more than five months. This examination must be made by a veterinary surgeon employed by the owner of the herd. A certificate stating the result of the examination must be forwarded within seven days by the veterinary surgeon to the Local Authority. Much of the milk consigned to Glasgow conforms to these requirements in so far as quality is concerned, but the herds of supply are not examined at least three times a year by a veterinary surgeon employed by the owner of the herd. In a pamphlet issued by the Scottish Board of Health it is stated—"This examination is a clinical one, and it will not provide any guarantee that Grade A milk will be free of tuberculosis." It must be frankly admitted that no clinical examination will by itself suffice to afford protection against bovine tuberculosis, but a clinical examination conducted at short intervals is more efficient than one conducted at longer intervals. I suggest, therefore, that every cow yielding milk for the food of man shall be examined when housed once a month, and when pastured once every two months.

The Milk and Dairies (Scotland) Act of 1914 takes cognisance of diseases other than tuberculosis, and provides that it shall be an offence to consign, sell, offer or expose or keep for sale for human food, or to use or suffer to be used in the manufacture of products for human consumption the milk of any cow which is suffering from any sore on the teats accompanied by suppuration or bleeding, or from any disease liable to infect or contaminate the milk. The other bovine diseases which may have a deleterious influence on man have been to a large extent overshadowed by the more common and dreaded tuberculosis. The more frequent examination by the veterinary practitioner would assist in the elimination of the danger from these diseases.

It is indisputable that a pure milk supply is of vital importance to the life of the nation. It is, therefore, a national question. Only a small proportion of the milk supply is produced and consumed in the same administrative district. It stands to reason that the same interests do not necessarily obtain in the producing and in the consuming areas. The interests of the producing areas are in most cases rural, with the majority of the represetatives on the administrative bodies interested in agriculture. Unfortunately, there have been indications of a lukewarmness in some of the producing areas in enforcing the meagre requirements of the Dairies Act and the Tuberculosis Order, which is not conducive to the wellbeing of the nation. The interests of the producing areas may be stated to be purely mercenary. On the other hand, the interests of the consuming areas are of paramount importance, being a question of life or death. It is imperative that every source contributing to the milk supply shall be undefiled, and remain pure as it passes from the producer to the consumer.

I am adverse to Government Departments interfering with local administration, but, taking into consideration the national need of a pure milk supply, I am of opinion that a Central Control would solve many of the present administrative difficulties and ensure a purer milk supply. This Central Control ought to be composed of experts capable of advising local executive officers, and at the same time provide facilities for the examination of all material collected in the field.

Under the Tuberculosis Order no provision is made by the Ministry to assist the local veterinary inspectors in diagnosing tuberculosis. In many cases a correct diagnosis can only be arrived at by the detection of the *Bac. tuberculosis*. This entails a microscopical examination, and can only be carried to a successful issue by an experienced microscopist.

In Denmark all milk and other specimens selected by the veterinarians are examined in a central laboratory in Copenhagen belonging to the Ministry of Agriculture. The work of examination is undertaken by two veterinary surgeons. The work done in this laboratory is highly satisfactory, as the percentage of error in diagnosis is only 1 per cent. The accuracy of the diagnosis of all positive cases is controlled by a microscopical examination of a portion of the udder which must in all instances be forwarded to the laboratory immediately the cow has been slaughtered. In the event of a negative diagnosis by the laboratory experts which is not accepted by the veterinary surgeon, a small portion of the udder is removed by a harpoon and forwarded to the laboratory. This is submitted to microscopical examination. During the years 1906 to 1912 one hundred and ninety (190) specimens secured by harpoon were examined, and the presence of tubercle bacilli was determined in 30 per cent. of these cases.

The tendency of the Ministry of Agriculture has been during recent years to take over the diagnosis of diseases scheduled under the Diseases of Animals Act, and it is somewhat amazing that no similar provision has been made

under the Tuberculosis Order. If it is necessary for an official of the Ministry to diagnose such diseases as anthrax, foot-and-mouth disease, swine fever, and sheep scab, it is more necessary for the Ministry to undertake the work of diagnosis in the case of tuberculosis, because it entails more time and greater experience. The Central Control would be in a favourable position to encourage stock-owners to undertake the work of eradication, and could also supervise this work. The necessary tuberculin could also be manufactured in the laboratory.

The expenditure incurred in carrying into effect the scheme outlined would be trifling in comparison with the large sums at present expended annually in the treatment of patients among the human population ; the loss of wage-earning capacity of the patients ; and also the huge sums expended for the eradication of other bovine diseases which have little influence on the health of man.

A rough estimate of the annual expenditure required in Scotland to give effect to the above suggestions may be given as—

Examination of herds	£100,000
Eradication of disease	15,000
Central Control	5,000
	£120,000

This sum cannot be regarded as exorbitant, as it would eventually reduce not only the expenditure at present incurred in the treatment of persons infected with bovine tuberculosis, but the number of persons infected through the bovine type of the *Bac. tuberculosis*.

ABSTRACT.

[Experiences of the "Roaring" Operation. ECKERT (1928) *Ztschr. f. Vet-Kde.* 40. 2H, 33-50. (Results collected from 33 roarers).]

The majority are stallions or geldings. All horses with demonstrable asymmetry of the larynx are certain "roarers." On this point, an animal may be a "roarer" without exhibiting the usual symptoms. The degree of the roaring need bear no relation to the pathological change, nor do both of these have any bearing on the result of the operation. Thus no prognosis can be given. The result of the operation can be gauged at the earliest after one year. The result of the operation can be stated as "cured," "workable," and "not cured." The author's results are cured 30·44 per cent., workable 17·38 per cent., and uncured 52·18 per cent. When possible, horses operated on should be rested three months and even then worked gently. The healing is not complete in six weeks. As unfavourable complication, chondritis and perichondritis of the cricoid cartilage are to be noted.

DIVISIONAL REPORT.

Western Counties Division.*

AUTUMNAL MEETING AT TAUNTON.

The autumn meeting of the Western Counties Division, N.V.M.A., took place at the Great Western Hotel, Taunton, on Thursday, November 15th, 1928. The President, Mr. H. K. Roberts, M.R.C.V.S., occupied the chair, other members present being Messrs. C. Masson, W. N. Wright, E. J. Thorburn, A. G. Saunders, E. W. Bovett, E. G. Conisbee, S. J. Motton, J. Cochrane-Dyet, J. K. Irvine, and L. Norman, with the Hon. Secretary, Mr. R. Barons Nelder ; and Messrs. L. W. Bovett, L. W. Taylor and H. G. McShane were present as visitors.

The minutes of the last meeting, as published in the *Veterinary Record* were taken as read, and were confirmed and signed as correct.

Correspondence. (1) Apologies for inability to attend the meeting were received from Professor Hobday, Messrs. J. Dunstan, E. R. Edwards, F. T. Harvey, H. B. Kauntze, W. B. Nelder, R. H. Penhale, W. Ascott, E. C. Bovett, and R. H. Smythe.

(2) From Dr. Bullock, thanking the Division for the letter of congratulation sent him.

(3) From the Secretary of the Victoria Veterinary Benevolent Fund, acknowledging with thanks the receipt of £2 7s. 6d. collected at the last meeting, as an addition to the annual subscription.

(4) From Mr. R. J. Collings, agreeing to continue his membership.

(5) From the Secretary of the National Horse Association, soliciting support. This matter was left over for consideration at the next meeting.

(6) From the General Secretary of the National V.M.A., enclosing proposals of a suggested scheme for providing free treatment for sick animals of the poor. This question, it was decided, should be put on the agenda of the next meeting. Meanwhile, the Secretary was instructed as to a reply to the N.V.M.A.

New Members.—Mr. J. M. Walker, F.R.C.V.S. (Liskeard), was elected a new member of the Association, on the proposition of the PRESIDENT, seconded by Mr. S. J. MOTTON, and Mr. L. W. Bovett (Bridgwater), was nominated for election as a new member by Mr. E. W. BOVETT, seconded by Mr. E. J. THORBURN.

Early Veterinary Science.—A highly informative and interesting paper was read by Mr. C. Masson, M.R.C.V.S. entitled "A Brief History of Early Veterinary Science with extracts from the First Booke of Cattell."

[We reproduce Mr. Masson's paper, with discussion, at the commencement of this issue of the *Record*.—Ed.]

Mr. L. NORMAN, on behalf of the Division, proposed a hearty vote of thanks to Mr. Masson for his very interesting paper.

The PRESIDENT seconded the vote of thanks, which was endorsed by acclamation, and suitably acknowledged by Mr. Masson.

The meeting closed with a vote of thanks to the President for occupying the chair, on the motion of Mr. MOTTON, seconded by Mr. MASSON.

R. BARONS NELDER, *Hon. Secretary*.

* Received on 19th November

NOTES AND NEWS.

Diary of Events.

Dec. 31st—Meeting of the Finance Committee N.V.M.A., 10 Gray's Inn Square, W.C.1, at 4 p.m. Editorial Committee, 4-30 p.m.

Jan. 8th, 1929—N.V.M.A. Committee Meetings, at 10 Gray's Inn Square. 10 a.m., Appointments; 10-30, Veterinary Officers and Public Health; 11-30, Parliamentary; 12 noon, Organising. N.V.M.A. Council Meeting, 3 p.m., at 10 Red Lion Square.

Honour for Sir John M'Fadyean.

Sir John M'Fadyean has been elected an honorary member of the Swedish Veterinary Association in token of their appreciation of the scientific merit of his work for veterinary science. The election was made at the Society's meeting at Stockholm on the 20th October, 1928, and the Diploma of honorary member has been forwarded to Sir John with a complimentary letter from the President, Dr. Sven Nystedt.

We are sure all our readers will join with us in congratulating Sir John M'Fadyean upon this notable addition to the many dignities conferred upon him in recognition of his outstanding services to veterinary science. In honouring Sir John the Swedish Veterinary Association had, we feel, paid a tribute to the whole of the British Veterinary Profession, of which he is so eminent a member.

R.C.V.S. Library.

The undermentioned additions have recently been made to the Library of the R.C.V.S.:—

"Anthelmintics and their uses in Medical and Veterinary Practice," Chopra & Chandler, 1928;
"Local Immunisation. Specific Dressings," Besredka, 1927;
"Tuberculous Intoxications. Concealed and Masked," Hollos, 1928;
"Modern Methods in the Diagnosis and Treatment of Renal Disease," Maclean, 1927;
Annual Report of the Chief Medical Officer of the Ministry of Health, for 1927;
Annual Report of the M.O.H. of Salford, 1927;
Annual Report of the C.V.O., Liverpool, 1927;
"Maladies des Volailles," Lahaye, 1928;
"Tierärztliche Gebürtskunde und Gynakologie," Stoss, 1928.

Any of the above-mentioned works may be borrowed from the Library by members of the College on payment of postage both ways. Applications should be made to the Librarian, R.C.V.S., 10 Red Lion Square, London, W.C.1.

A Drunkenness Charge.

The following letter appeared in the *Evening Standard* of December 21st:—

Sir,—In your issue of this evening (December 20th), you report the committal for trial of Mr. J. H. Woodward on a charge of being drunk in charge of a car, the report being headed "Veterinary Surgeon Committed for Trial." I beg to inform you that Mr. Woodward is not a veterinary surgeon; being unqualified, he has no right to the title, and would be prosecuted if he so described himself. May I ask you therefore to be so good as to correct the mis-statement.

Fred Bullock,
Secretary and Registrar,
Royal College of Veterinary Surgeons.

The gentleman referred to was, we are informed, prosecuted by the Royal College of Veterinary Surgeons in 1926, for illegally using the title, and was convicted, with a fine of £5 5s. and £2 2s. costs.

CORRESPONDENCE.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents

The Advertisement of "Mock" Anthelmintics.

To the Editor of The Veterinary Record.

Sir,—Your editorial in the *Veterinary Record*, dated 8/12/28, brings to notice again the preposterous and ridiculous claims which are sometimes made in the advertisement of various patent medicines.

I should like to mention a most amusing passage in the advertisement of "mock" anthelminthics which, for carefully planned nonsense, cannot be equalled. The following abstracts are taken from a handbook entitled "Common Sense *versus* Worms." After stating that the expulsion of worms from the intestine of fowls by crude drugs, although perfectly simple, is fraught with many dangers, the author proceeds as follows:—

"Is there any method of remedying the worm evil "without resorting to harsh expellants and dangers "of re-infestation?
"There surely is."

"What is the principle of it?
"To assist the chickens to absorb by digestion and "assimilation both the worms and the worm eggs, "thereby retaining for themselves the nutriment which "the worms have stolen in getting their growth within "the intesti ies."

"How does it dissolve worms so effectively?
"It does not dissolve them. It merely increases and "strengthens the natural digestive juices of the bird "so that the bird itself is enabled to digest and assimilate "intestinal worms the same as it would digest and "assimilate garden worms or any meaty substance."

"Is this a natural process or is it artificial?
"It is Nature's way. Fowls in their natural state "harbored a few worms, apparently as scavengers of "the intestinal tract, but the life of these few worms "was short, as in a short time they would be digested "and assimilated by the digestive juices of the bird—"and, controlled in this way by Nature, a harmful "Surplus was rare. However, when man in his desire "for production and profit took the hen from her "natural habitat and developed her into an egg machine "to lay from 200 to 300 eggs a year instead of two or "three 'settings' a year to reproduce her kind—and "to do this plied her with high protein feeds, many of "which are heavily laden with worm larvæ—the conse-"quence has been a Surplus of intestinal worms which "the overworked digestive fluids of the fowls are unable "to digest and assimilate. And of course it is the "Surplus of these thieving parasites which sap the "vitality of the bird and cause the digestive disorders "and irritation which make such an excellent field for "the propagation of most poultry diseases."

Those who have a training in human or veterinary medicine may laugh at the absurdity of such claims, but it is only in virtue of their privileged position that they are able to do so. Such advertisements have been carefully planned by astute business brains which have measured to a fine degree the credulity of the public, and there is no doubt that the semblance of rational argument which they contain carries great weight with many a hopeful husbandman.

E. L. Taylor.
The Veterinary Laboratory,
Ministry of Agriculture and Fisheries,
Weybridge.

The Editor acknowledges the receipt of the following:—

Report of a meeting of the Southern Counties Division, from Mr. John Facer, Hon. Secretary.

Communication from Major H. E. Irwin (Tenderden).